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DECEMBER, 1955

50 CENTS

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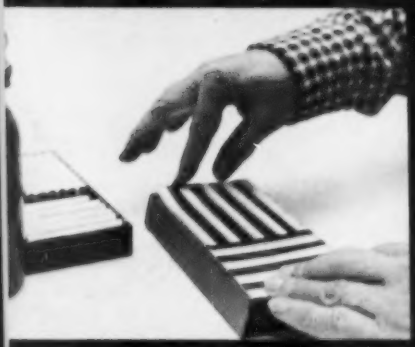

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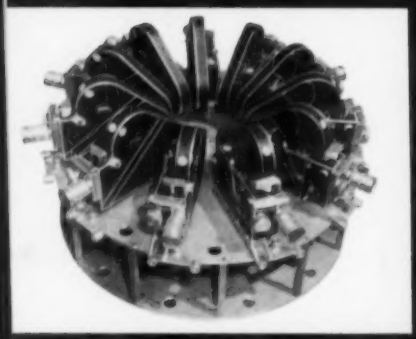

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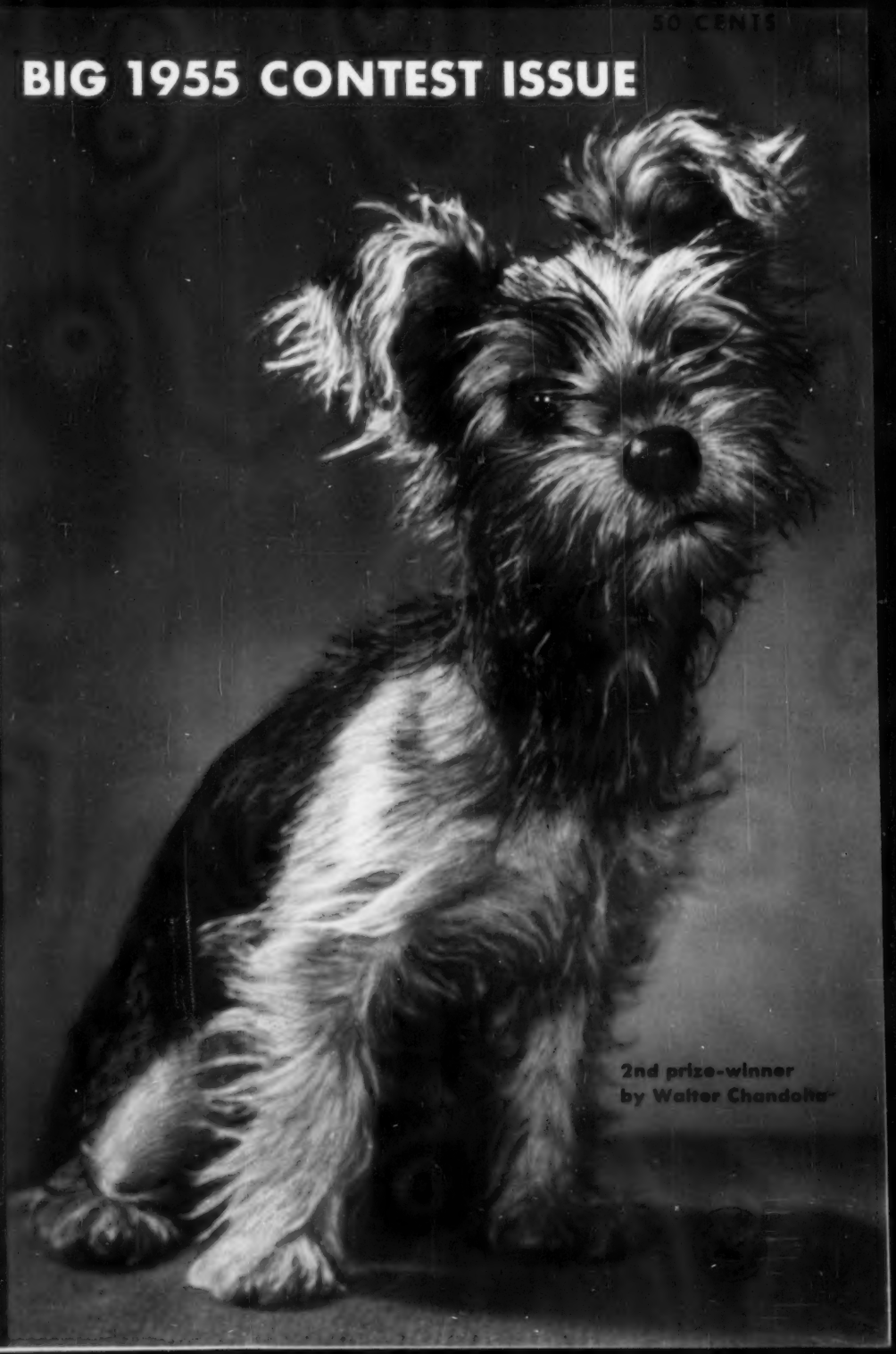

2nd prize-winner by Walter Chandoha

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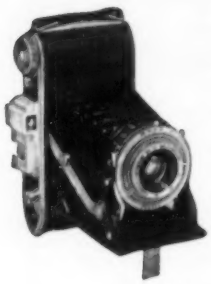

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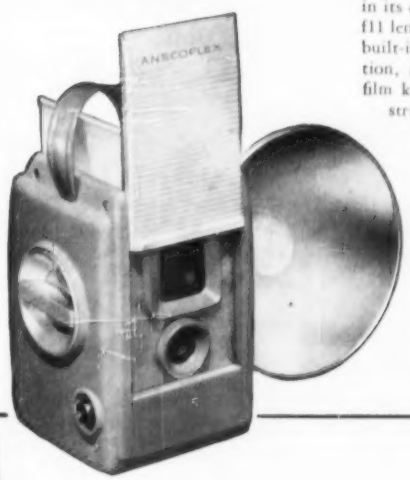

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VOLUME 37 NUMBER 6

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WORLD'S LEADING PHOTOGRAPHIC MAGAZINE

Our cover this month is the Second Prize winner, Color Division, 1955 POPULAR PHOTOGRAPHY International Picture Contest. The lucky photographer was Walter Chandoha of Huntingdon, L. I., the dog a Sydney Silky Terrier who behaved in this quizzical manner during a game of peekaboo with the man behind the lens. For more complete details on how the picture was made, see page 198, *Technical Data on the Pictures.*

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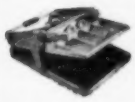

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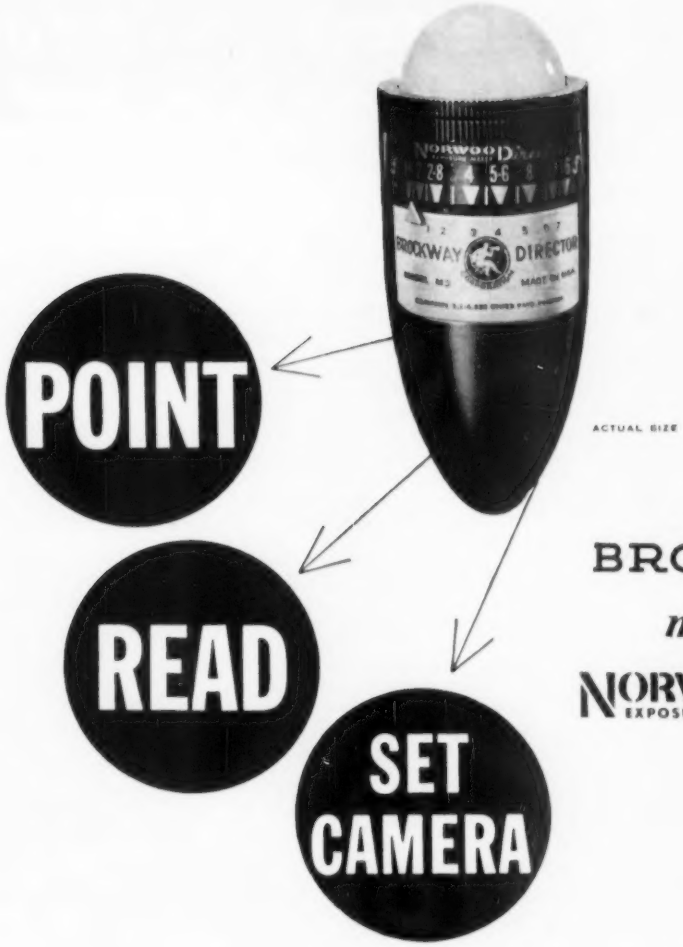

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letters to the editor

ED.

Mr. Knight and Available Light

Congratulations on your October article *I'm Sick of Available Light* by John Adam Knight. Most of such photos I've seen look like they were shot through a dirty oatmeal bowl rather than a hundred-dollar lens.

CHARLES MONEY
Syracuse, N. Y.

I must say I heartily agree with Mr. Knight. I've been in the photographic business for 25 years, and have made my share of "available light" pictures; but as a necessity, not a preferred practice. Exceptions, of course, like your beautiful color-section *Moon Pictures*, are in order —any other illumination would have destroyed the mystical quality of night.

J. RALPH LEISTER
Kittanning, Penna.

I wish I could shake the hand of the man who wrote the magnum opus on available-light photography. Whenever I see some of those pictures of a black cat in a coal bin, with only the after glow of the ash pit for light, I wonder if my eyes need glasses, or if the photographer has had too many glasses—not of the optical type.

CHARLES B. DUNCAN
Milford, Conn.

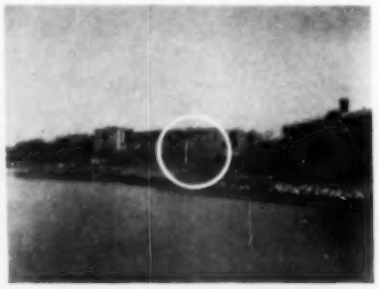
If the bombastic Mr. Knight would bother to think about what he has said, he might (if his ego could stand it) come to the realization that a good picture is good because it elicits an instantaneous emotional response in the viewer. It can do this by a variety of means, some having to do with one's own experiences, some for other reasons. A picture may fail to bring about this excited interest if it has been accomplished poorly from a technical standpoint—you just can't believe in it. But if the appeal is strong enough, and all the elements work together, then one does not think, really, about its technical aspects. We may later, but whether high or low quality, the photograph has done what it tried to do. If it is something valuable, it is a good picture.

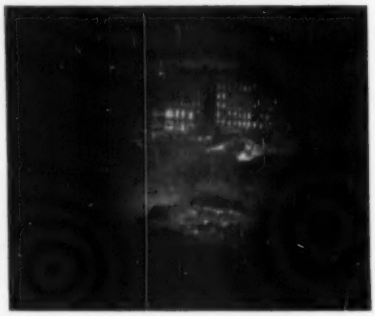
People who continually carp about technical quality miss the whole point. They either have no responsive qualities themselves, or they're looking only at mediocre pictures. And Mr. Knight's whoopedoo about intensification is such a *dog*. You might tell him to read some of Bob Schwalberg's stories on exposure-development practice sometime; Mr. S. seems to be on the right track

MYFANWY ARNAUD
Cleveland, O.

Binocular Photography Makeshift Style

Here's something that might interest your readers . . . a makeshift telephoto lens. I held a pair of binoculars to the viewing lens of my twin-lens reflex and adjusted the binoculars for maximum sharpness. I then placed that eyepiece to





Normal shot (top), and with binocular.

the taking lens and snapped the shutter. My batting was pretty good. I had the enlarged object centered on the film four out of five times. Enclosed are some of the results.

ROBERT SONIUS
New York, N. Y.

• *It looks as though we know pretty well what our readers hanker to try these days; on pp. 98-101 in this issue we have an article dealing with the whole problem of how to take pictures through binoculars and telescopes—and with new equipment to help get more good pictures than Mr. Sonius' four out of five.*—ED.

The Trite and the True

Your May 1955 article on how to win in the POPULAR PHOTOGRAPHY yearly Contest left out the most important piece of advice. I have studied the past five Contests carefully and am ready to announce my findings: *to win, the contestant must send in a picture which happens to be the judges' pet cliché at the moment.* Some clichés are perennials:

1. *Wistful Children.* These won four Contest First Prizes in a row. In 1953, *Wistful Little Girls* won three out of five top prizes in the Black-and-White class.
2. *Female Nudes.* Need I say more?
3. *Cats.* Be sure to pick either a black cat or a white cat. There hasn't been a photo contest since Daguerre without a few winning Cat entries.

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A shrewd contestant will combine two clichés in one picture and so double his chances. For instance, a *Wistful Little Girl Holding a White Cat* won a top prize in '53.

Other clichés come and go. *Seagulls, Dancers, Slum Kids, Traffic Lights* (the latter good for Color Division only) have all been good for years. *Oriental Children* are probably the top POPULAR PHOTOGRAPHY cliché now; they should do well for years. *Bullfights* cleaned up handsomely in '54. *The Brooklyn Bridge* has been a top cliché for three quarters of a century . . . an alert 1954 entrant sent a picture of *A Little Chinese Girl on the Brooklyn Bridge* and was rewarded with a prize.

As I have tried to find some of my own photos that match your 1955 fads, I naturally cannot sign my true name . . .

"SOUR GRAPES"
Philadelphia, Pa.

• *As descriptions of photographs, "Sour Grapes'" terms are inconclusive at best. They cover only the basic area of subject matter. Who would say that the pictures themselves are clichés? Are they not excellent pictures of cats, children, etc? At any rate, the reader is directed to turn promptly to page 102 so he may decide for himself if our winning pictures are "clichés" this year.*—ED.

Repentant Reader

Letter #1, August 3, 1955

Regarding the *Neutral Gray Card* story by Lloyd West in the September issue: If West sticks to his gray side all will be well, but beware when he turns to the white for a dim-light reading! If my arithmetic is correct, there should be an overexposure of about 25 times with his system for White Card readings. I quote him: ". . . indicated exposure taken from the white side is to be increased five times. . . ." Shouldn't this be *decreased*?

JOHN P. STARKS
Maplewood, N. J.

Letter #2, August 24, 1955

Regarding a certain letter concerning a "goof" in the *Neutral Gray Card* story . . . There's no goof like an old goof, and I accept the cut-glass earmuffs for my letter. The other day I thought about it . . . and in a blinding flash it all came to me . . . My most sincere apologies.

JOHN P. STARKS
Maplewood, N. J.

• *For the benefit of other readers who had no Blinding Flash like Mr. Starks', exposures based on White Card readings must be increased five times because the white side reflects that much more light than the average subject actually reflects, thus indicating via the meter an aperture five times smaller than it should be. You therefore multiply the exposure speed by five or open the lens 2¼ stops to get the actual correct exposure. (You use the white side because in dim-light situations the average subject—or gray card—may not reflect enough light to activate the meter.) You can short-cut the method when using the white side by setting the meter at a film speed one fifth of its actual speed, then using the exposure the meter does indicate.*—ED.

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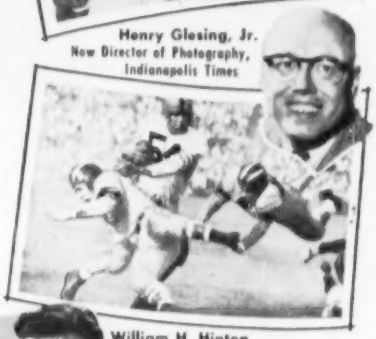

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New Director of Photography, Indianapolis Times

William H. Mortimer Making Good with Large Commercial Studio

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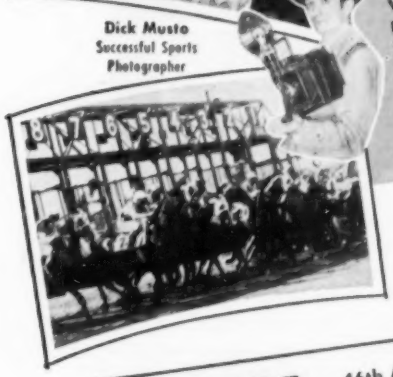

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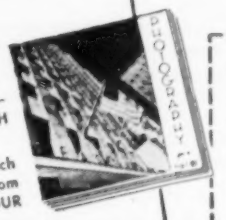

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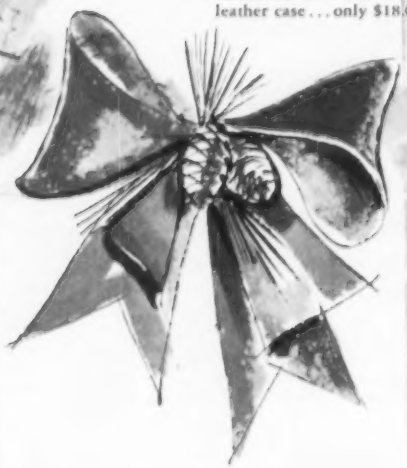

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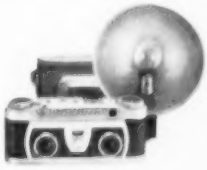

COMPLETE OUTFIT
$79.50

CAMERA ONLY
$66.50

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You can load up to 150 slides!

You can enjoy full hour shows . . . automatically!

And you can feed, project, change and restack your slides in proper sequence . . . without handling a single one — in fact, with just a touch!

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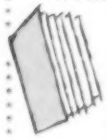
Other models priced $49.50 to $154.95

finest budget-priced automatic 35mm slide projector made

Really new in every way! Packed with features found only in La Belle's most expensive models, including: touch system control, automatic full-hour shows, blower-cooling, 5" f/3.5 lens, completely uniform 300-watt illumination, no slide-wipe, glare or extended blackout when changing slides, and . . . it's less than 7 pounds!



Your La Belle dealer is the man to see. Visit him soon!

FREE BOOKLET!

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Oconomowoc, Wis., Dept. P.P. 12

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Atop stadium roof. Mason (Right) works his Exakta while other photographer uses a "Big Bertha" with 20 inch lens. Along with the operator of the Big camera a spotter is necessary to record the plays.

University of Conn.—University of Maine Game, taken with an Exakta from stadium press-box, 500th of a sec. at f:8. 135mm lens.

You can photograph it easier with an Exakta!

Newspaper photographer Wesley L. Mason gets thrilling, close-up action-packed football shots the EASY way with his 35-mm Exakta. "He gets such amazing results that other photographers sit up and take notice."*

You too can get perfect, action-packed sport shots, everytime, the easy way . . . with a 35-mm Automatic Exakta VX.

The Automatic Exakta VX with Penta Prism eye-level viewfinder and Split-image Rangefinder and 58-mm, f/2.0 Automatic Biotar Lens is priced at $392. The Automatic Biotar Lens alone, $162.80. • The Automatic Exa has most of the advantages of 35-mm, automatic, single-lens reflex photography in a camera foolproof enough for a child to use. The Automatic Exa with Penta Prism eye-level viewfinder and Split-image Rangefinder and 50-mm, f/2.8 Automatic Isco Westanar lens is priced at $165. Automatic Isco Westanar Lens alone, $69.50.

Your dealer will gladly demonstrate these outstanding cameras to you.

*This is directly from an article by Arthur J. Kiely, Jr., Sports Writer for the Hartford Courant.

EXAKTA CAMERA COMPANY, 705 Bronx River Road, Bronxville 8, N. Y.

Exclusive Factory Appointed Representatives in the U.S.A. for Sales & Service of Exakta and Exa Cameras

Be sure and see MINIFILM'S other Bargain-Filled pages in other magazines this month!

10% DOWN—10 MONTHLY PAYMENTS

You can now buy a complete 8mm Movie Turret Camera with Lenses— at the price of the Camera alone!

CAMERA	NORMAL	WIDE ANGLE	TELEPHOTO	USED SPECIAL
Bolex B8	f2.5		1½" f3.5	$ 82.50
Keystone K35	f2.5	7mm f2.5	1½" f3.5	$ 92.50
Revere 99	f1.9	7mm f2.5	1½" f3.5	$ 92.50
Revere 84	f1.9	7mm f2.5	1½" f3.5	$ 97.50
Revere 44	f1.9	7mm f2.5	1½" f3.5	$109.50
B&H 134 TA	f1.9	7mm f2.5	1½" f3.5	$122.50
B&H 172 A	f1.9		1½" f3.5	$127.50
DeJur Fadematic	f1.9	7mm f2.5	1½" f3.5	$137.50
Bolex H8 Leader	f1.9	7mm f2.5	1½" f3.5	$127.50
			1½" f3.5	$109.50

FREE Exakta Course—How to get the most out of your camera."

EXAKTA VX SALE
SAVE OVER $150

Brand New Cameras with Split-Field Rangefinder Penta Prism
with f1.9 Auto Meyer Primoplan Preset, Reg. $326.50 — **Special $199.50**
with f2 Zeiss Biotar Preset Reg. $392.50 — **Special $239.00**
with f1.5 Angenieux Preset Reg. $416.50 — **Special $239.00**
Furnished with Factory Authorized Guarantee, Import Certificate and Owner's Registration.
*Sent with any Exakta Camera you buy.

IF YOU THOUGHT STEREO WAS BEYOND YOUR REACH... MINIFILM DISPROVES IT!

We have at last succeeded in obtaining a stereo camera that is made to professional standards, and priced so that a beginner can afford it. We can't mention the name of this fine German Import but it is the most popular Stereo Camera in Europe. This sale precedes its mass introduction to the American Market. We only ask that you check the features and compare with stereos costing twice the price!

- Matched f3.5 Steinheil Cassar Lenses
- Rapid Wind Lever transports film, cocks shutter, moves film counter and prevents double exposure.
- Speeds to 1/200th sec.
- Flash Synchronization
- Satin chrome and black morocco leather finish

Flash Gun $7.95
Case $6.95
ONLY **$49.95** BRAND NEW

FREE 35mm Battery Operated SLIDE VIEWER included!

LEICA IIIF
- f2 Ctd. Summitar Lens
- 1 Sec to 1/1000th
- Full Synchronization

USED **145.95**

	Used
w/f1.5 Xenon	
w/f2 Summicron	$170.00
w/f1.5 Summarit	177.50
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WE SEARCHED OUR BUYERS SCOURED AT HOME AND ABROAD

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WE TESTED
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WE FOUND IT! NATIONALLY ADVERTISED FAMOUS NAME EXPOSURE METER

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Blower-Cooled Top-Make USED

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Golde Manumatic 300 Watt	56.50	25.95

SAVE OVER 60%

Berthiot Pan Cinor f2.8 Z-ZOOM LENS for all 16mm cameras
Brand New disc. model
With FINDER reg. $447.50
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EXCLUSIVE GERMAN IMPORT

RAPID WIND 35mm COLOR CAMERA

No other 35mm camera anywhere near this price, offers so much . . .
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- f2.8 CTD. LENS
- COUPLED RANGEFINDER

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Synchro Shutter • Double Exp. Prev. • All Metal Const. • Compact design • Fully Guaranteed

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Leather Eveready Case	6.95	4.95
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ONLY $8.95 10% Down **GETS YOU THE AMAZING 35mm LORDOMAT**

NO OTHER CAMERA IN THE WORLD, UNDER $100 OFFERS THESE 3 VITAL, VERSATILE FEATURES!

1. INTERCHANGEABLE rangefinder-coupling LENSES normal telephoto wide angle
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with f2.8 LORDOM Lens, click stops.
Only $89.95

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3 LENS BOLEX H16 OUTFIT
A terrific buy at this **WHOPPING LOW PRICE!**

You get:
- Bolex Camera Body used, plus Brand New Lenses
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- 25mm f1.9 Normal Angle
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Brand New

COMPLETE **$229 USED**

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Top, nationally advertised brands used—Guaranteed.

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Kodak Brownie	39.50
Keystone "K-70"	39.95
Keystone "K-109"	88.00

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BRAND NEW RECTAFLEX
f2 Schneider Xenon Coated Lens . . .
REG. $329.50 **YOUR COST $199.50**

BRAND NEW RECTAFLEX
f1.5 Angenieux Coated Preset Lens
REG. $450.00
DISC. MODEL **YOUR COST $249.50**

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It Saves You Money! It Assures You Perfect Exposure!

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Colormatic control, Incident or Reflected Light

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• GE DW 68	24.50	11.50
• GE PRI	32.50	16.50
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BRAND NEW FOR KINE EXAKTA RANGE-FINDER PRISM
Eye level view-finder and automatic split image range-finder. Complete with extra ground glass and case.
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Brand New EXA with f2.8 CTD Westar Lens **Plus** Brand New 90mm f4 Sun CTD Preset Tele Lens REG. $149.95 **SPECIAL $86.50**

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NOBODY BUT MINIFILM OFFERS YOU THESE LOW, LOW PRICES, AND . . .

1 ONLY 10% DOWN 2 10 MONTHLY PAYMENTS

3 30 DAY FREE TRIAL 4 2 YEAR SERVICE GUARANTEE

HERE'S ALL YOU HAVE TO DO

1. Select the equipment of your choice at the prices shown in column one for new equipment or column two for used equipment.
2. If you have equipment to trade, check if it is represented in listing and deduct the allowance shown for it in column three.
3. Rush your order (and trade-in equipment if you have such) plus your remittance to cover—or instructions to ship C.O.D. for the balance or deferred payment terms as per your instructions.

Lenses for LEICA, CANON, CONTAX, NIKON

	New	Used	Trade-in
28mm f3.5 Serenarg. W.A.	$134.00	$ 79.50	$ 55.00
35mm f2.8 Biogon W.A.g	183.00	126.95	90.00
35mm f3.2 Serenarg W.A.	94.00	69.50	45.00
50mm f3.5 Elmarg	57.00	34.00	25.00
50mm f1.5 Sonnarg	175.00	98.00	65.00
50mm f2 Summicrong	156.00	98.00	75.00
85mm f1.5 Lithogong	199.50		95.00
85mm f2 Nikkorg	179.50	89.00	70.00
85mm f1.5 Summarexg	360.00	179.00	140.00
100mm f4 Serenarg	87.00	39.00	25.00
105mm f2.5 Nikkorg	152.50	104.00	75.00
135mm f4.5 Leitz Hektor Blk		63.95	40.00
135mm f4 Sonnarg	146.00	88.00	65.00
300mm f5.6 Kilarg	149.95	97.50	70.00

Lenses for EXAKTA, CONTAX D, PRAKTICA, PENTACON

	New	Used	Trade-in
28mm f3.5 Angenieux	$120.00	$ 73.95	$ 60.00
40mm f3.5 Makro Kilar Model Dg	114.95	78.50	60.00
50mm f1.9 Xenon Auto	169.50	119.00	85.00
58mm f2 Biotarg		44.00	25.00
85mm f1.5 Lithogong	179.50		85.00
90mm f2.5 Angenieux	94.50	58.50	40.00
90mm f4 Sung	51.95	17.50	10.00
135mm f3.5 Angenieux	89.50	54.50	30.00
135mm f3.5 Sun preset	74.95	36.50	25.00
150mm f5.6 TeleyXenarg	64.95	39.50	30.00
360mm f5.5 Schneider Tele Xenarg	169.95	98.00	75.00
400mm f5.5 Tele Megor	134.50	97.50	75.00

ACCES. FOR IMPORTED CAMERAS

	New	Used	Trade-in
Leitz Adapter for Leica M3	$ 10.50		
Leitz Mirror Reflex Housing	102.00	$ 69.00	$ 50.00
Zeiss Contameter Close Up	81.00	43.00	30.00
Novoflex Bellows for Leica, Contax	34.50	22.50	15.00
Novoflex Reflex Housing for Leica	99.50	69.50	50.00
Novoflex Tripod and Stereo Rackover	18.50	12.00	9.00
Novoflex Universal Panoramic attach	11.50	7.00	4.00

LEICA CONTAX NIKON CANON

	New	Used	Trade-in
Canon IV S2 f1.8 Serenarg*	$284.00	$131.95	$115.00
Contax I f2 Sonnar		59.00	35.00
Contax II f2 Sonnar		82.50	65.00
Contax IIA f1.5 Sonnarg*	374.00	168.95	145.00
Contax IIIA f2 Sonnarg*	$383.00	$179.50	$145.00
Leica IIIC f3.5 Elmarg		89.95	65.00
Leica IIIF f3.5 Elmarg*	237.00	131.95	110.00
Leica M3 f2 Summicrong*	447.00		220.00
Nikon S2 f1.4 Nikkorg*	345.00	224.00	170.00
Nikon F2 Nikkorg*	269.00	153.95	105.00

35MM SINGLE LENS REFLEX

	New	Used	Trade-in
Alpa 7 f1.8 Switarg*	$459.00		$200.00
Exa f2.8 Westar MXg	85.00	$ 44.95	35.00
Exakta VX f2 Automatic Biotar R.F.g	392.00	224.00	180.00
Exakta V f2 Biotar MX		119.00	90.00
Exakta VX f2.8 Auto Westanar	239.50	149.50	125.00
Contaflex I f2.8 Tessar Auto R.F.g meter	169.00	83.95	75.00
Pentacon f2 Biotar pre-set*	179.00	129.00	100.00
Praktica FX f2.8 Westar MXg	79.50	42.50	30.00
Praktica FX f2 Biotar P.S.	99.95	84.00	65.00

35MM CAMERAS

	New	Used	Trade-in
Argus C3 Case & Flash	$ 66.50	$ 31.50	$ 25.00
Argus C4 f2.8 RF MX	84.50	43.95	35.00
Bolsey Jubilee f2.8 Setomatic R.F. Case and flash	79.50	49.50	25.00
Bolsey C f3.2 Reflex RFg*	89.50	38.95	15.00
Clarus f2.8 RFg*		37.50	20.00
Kodak 35 f3.5 RF		28.95	20.00
Kodak Retina IIC f2.8 R.F.g	135.00	105.00	65.00
Kodak Pony 135 f4.5 C*	29.75	17.50	12.00
Konica II f2.8 RF MXg*	84.75	57.50	35.00
Retina II f2 Xenon RF		57.00	35.00
Minox II f3.5g		48.95	30.00

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1956 FACTORY PACKED Daylight or Type A

8mm 25ft. Double Rolls	16mm 100 ft. Roll
4 Rolls $9.45	1 Roll $7.15
7 Rolls 14.99	3 Rolls 19.95
8mm 25 ft. Mag.	16mm 100 ft. Mag.
3 Rolls $9.75	3 Rolls $14.95

PRESS CAMERAS

	New	Used	Trade-in
23 Ann Graphic RF f4.5 Lens		$ 82.95	$ 55.00
2x3 Linhof Super Tech RF 3 lenses comp.	$569.00	317.95	270.00
3¼x4¼ Pacemaker Crown f4.7 RRFg*	267.45	138.75	100.00
4x5 1955 Pace Crown f4.7 Multifocus R.F.	287.50	198.00	150.00
4x5 B&J Press f4.7 Kalart R.F.	197.50	89.50	60.00

SLIDE PROJECTORS

*Blower Cooled	New	Used	Trade-in
Kodaslide Signet 500W*	$ 72.50	$ 49.00	$ 35.00
Revere 888 500W Auto Remote Case	119.50		60.00
Revere 444 300W*	69.50	30.95	22.00
TDC Mainliner 300W Semimatic*	59.50	30.50	25.00
DC Duo 500W 2¼*	84.50	51.95	40.00

8MM CAMERAS

	New	Used	Trade-in
B&H 172 B f1.9 Mag.g	$164.95	$ 99.95	$ 75.00
Bolex C8 f2.8 Yvarg	89.50		40.00
Kodak Brownie f2.7g	37.50	20.95	15.00
De Jur Citation f2.5g	77.50	37.95	30.00
Keystone K 30 Capri f2.8g	54.95	33.95	25.00
Keystone Bel Air f2.5 Magg	89.50	46.95	35.00
Revere 40 f2.5 Magg	99.50	52.95	40.00
Revere B61 f1.9 Magg	137.50	80.95	60.00
Vistascope Outfit, Case	75.00		40.00

16MM CAMERAS

	New	Used	Trade-in
Auricon Cine Voice f1.9g	$749.00	$538.00	$350.00
Bell and Howell Automaster Mag. Tur f1.9		129.00	90.00
B&H 200T f1.9 Mag turg	244.95	157.00	125.00
B&H 70 DL f1.9 Turg	365.50	218.00	175.00
Bolex H-16 De Luxe f1.4 Tur Octamtrg	486.00	295.00	225.00
Cine Kodak Mag. f1.9	*	54.95	45.00
Cine Kodak Special II f1.9g Tur	990.00	599.00	400.00
Eigeet Stereo Outfit Complete Spec.	89.50	69.50	40.00
Pathe Super 16 Turg	450.00	279.00	180.00

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2¼	up to 2¼x2¼	C	Condenser
23	up to 2¼x3¼	D	Diffusion
2.35	both 35 and 2¼x2¼	CL	Coldlite
45	up to 4x5	AU	Auto Focus

	New	Used	Trade-in
23C or De Jur II f4.5g	$ 99.50	$ 59.50	$ 30.00
35C Federal 135 f4.5 storway	49.95	29.50	20.00
23D Federal 240 f7.9 storway	24.95	14.50	10.00
23D Federal 269 f6.3 storway	39.75	21.95	12.00
23C Federal 279 f6.3 storway	46.95	25.75	17.00
23C Federal 311 f4.5 storway	69.75	39.95	25.00
23CL Federal 315CL f4.5	80.00	49.50	30.00
45C Besseler 45M	198.75		90.00
57CL Besseler 57MB	239.75		160.00
45C-AU Omega D3 AutoFocus	297.50		105.00
45C Federal 470 f4.5	129.50	82.50	60.00
45CL Federal 450CL f4.5	114.75	69.50	50.00
23D Fotolarger Merit f6.9	23.95	14.50	10.00
23D Fotolarger D45 f4.5	48.20	27.50	20.00
57D Solar 57D	86.50	49.00	35.00

16MM SOUND PROJECTORS

	New	Used	Trade-in
B&H 285C 750W Case	$449.95	$249.50	$200.00
B&H 202C 1000W Magnetic Case	699.00	444.00	375.00
Revere SP16 750W Case	325.00	163.00	135.00

g coated * flash synchronized

Prompt Free appraisal and Quotation will be gladly rushed to you by return mail. Mail Orders promptly filled. Paid or C.O.D., F.O.B. New York. Note: On C.O.D. kindly include 10% Deposit on Order. Include Postage. Prices Subject to change.

KODACHROME 35mm GUARANTEED Factory Fresh RELOADS

35mm 20 Exp. Factory Packed Daylight or Type A

3 Rolls 5.55—6 Rolls 10.50

These Cartridges are Laboratory packed and Quality Controlled by MINIFILM in its own Air Conditioned Darkrooms. Twenty and 36 Exposure Cartridges are manufactured daily from 100 ft. rolls received fresh from Eastman Kodak and Ansco. Careful supervision and tremendous sales turn-over insures your getting reloads which are equal in quality and freshness to cartridges packed at the factory. THE ONLY THING DIFFERENT IS THE PRICE. . . . Daylight or Indoor. PRICES INCLUDE DELUXE DEVELOPING AND CUSTOM MOUNTING.

ANSCOCHROME		ANSCO COLOR		EKTACHROME	
20 Exp.	36 Exp.	20 Exp. Rolls	28 Ft. Sealed Cans	20 Exp.	36 Exp.
1 Roll 2.50	1 Roll 3.75	3 for 4.95	1 Can 11.95	1 Roll 2.50	1 Roll 3.75
3 for 6.65	2 for 6.95	6 for 9.59	2 Cans 23.39	3 for 6.95	2 for 7.35
5 for 10.50	3 for 9.99	10 for 15.49	3 Cans 33.95	5 for 10.95	3 for 10.50

EKTACHROME 35mm—20 Exp.

Factory Packed

1 Roll $2.85 • 3 for $7.50

Price Includes Develop. & Mount.

35mm Ektachrome Bulk Film 1956 Dated 28 Ft., Price Incl. Dev. & Mtg. $16.95 No Dev. 28 Ft. $11.50—100 Ft. $38.00

28 ft. 35mm ANSCOCHROME Incl. Film Leader, 8 Cans; 8 Mail Bags —Developing & Mounting for 8 rolls $14.95

MINIFILM COLOR LABORATORIES

SPARKLING COLOR PRINTS

2x3¼	—Usually 35¢—Our Price 20¢ ea.
2½x3¼	—Usually 54¢—Our Price 25¢ ea.
3¼x4	—Usually 75¢—Our Price 47¢ ea.
4x5	—Usually 1.00—Our Price 57¢ ea.
5x7	—Usually 1.50—Our Price 89¢ ea.
8x10	—Usually 3.00—Our Price 1.85 ea.

24 HR. COLOR FILM DEVELOPING

35mm Ansco Color mtd. $1.00; 3 for $2.70
35mm Ektachrome mtd. $1.25; 3 for $3.25
35mm Anscochrome mtd. $1.25; 3 for $2.75
120/620 Ektachrome or Ansco..... $1

KODAK'S MIRACLE TRI-X 35mm

20 Exp. 6 Rolls $1.99—10 for $3
36 Exp. 4 Rolls $1.99—7 for $3.15
50 feet $2.45 100 feet $3.95

KODACHROME STEREO 20 EXPOSURES DAYLIGHT OR TYPE A* 3 ROLLS 9.75

Prices Include Developing & Stereo Mounting

ANSCOCHROME STEREO 20 EXPOSURES 3 ROLLS 9.75

LOAD YOUR OWN 35mm ANSCO CHROME (SO QUICK — SO EASY — SO ECONOMICAL) A CHILD CAN LOAD A ROLL IN 90 SECONDS! A 20-EXP. ROLL COSTS ONLY $1.11

1. A Daylight Bulk Film Leader
2. 28 ft. of Ansco Chrome—enough for 8 rolls (tongued—frame numbered—1956 date)
3. 8 Brand new cassettes 4. 8 Mailing bags

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Prints From Transparencies!

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3 x 3 ..... 40¢
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color clinic

by David B. Eisendrath, Jr.

A famous technician solves your problems

Some time ago you suggested the use of silica gel for dehydrating films before putting them back in my deep-freeze, once the sealed package was opened. My photo dealer says that he's heard that silica gel affects color film and shouldn't be used with it.—M. J. S., Paducah, Ky.

I've been using silica gel with color film for years and never had any such trouble, but I checked with the film manufacturers on this. The people from Ansco and Kodak both tell me that silica gel may affect an emulsion if the material itself gets in contact with the film; if the film does not touch the silica gel, however, they have found no bad effect. I wrap my film in a piece of black paper such as comes in film packages, I put the silica gel containers in the bottom of a tight can or tank (I use a stainless steel developing tank), and stand the wrapped bunch of film on edge on top of it, then seal the tank with wide tape. The silica gel absorbs the moisture in the tank, in the paper, and in the film. The film gives up most of its moisture within a week, and I then tightly wrap it in paper or foil, then put a vapor-proof freezer bag around the box, which has been resealed, and pop it into the deep-freeze. It will keep for several years that way with no difficulty. Just be sure that the silica gel itself does not touch the film. Easiest way to buy and use silica gel, I think, is in the small cans put out by the Davison people; most camera stores handle it or can get it for you. After you've used this for some time and it picks up moisture, an indicator tells you when it's loaded with moisture (it turns pink) and you just bake the container in your oven for a few hours, driving out the moisture it has accumulated in use.

●

I have one of the new Norwood exposure meters that has the red "Color-Matic" slide. When this slide is in place you are supposed to set the shutter at 1/50 second and with color film in the camera you take a reading and read directly in f-stops from the meter. What I would like to know is this: Is there a difference between the red slide and the black slide? I get the same readings with either in the meter. How can I use this with the new Ektachrome, which has a much higher speed than the Kodachrome I'm now using?—L. L. B., Des Moines, Iowa.

If you are using the red slide that is usually supplied with the meter, it is just like the black slide also supplied with this meter. However, the manufacturer makes and supplies other slides for use with films of other speeds. If you wanted to take direct readings in f-stops at 1/50 or 1/100 for films such as the new Ektachrome, or perhaps with a black-and-white film with a higher speed reading, you can get slides specifically for this purpose. Just write to Brockway Director Co., 570 Fifth Avenue, New York 36, and tell them the model of your meter, what speeds you want to shoot at with which film, and they'll sell you new slides for fifty cents each.

●

Some time ago I wrote asking about shooting color slides off the screen of our local movie house. We've followed your suggestions, and enclose slides made on Type A Kodachrome at f/6 at three seconds and at four seconds. Now we've bought a movie camera and would like to know if I could make pictures off the screen with it with my f/1.9 lens and color film. Would type A film be preferable to daylight-type? What do you think?—C. A. C., Lansing, Michigan.

My guess is that with the exposure data you've supplied and the excellent transparencies you sent along, you'd have to figure that with the basic exposure of f/5.6 at three seconds, with the light being about the same, and with a lens open at f/1.9, you'd need an exposure of about 1/3 second. However, you'd not be able to shoot your movie camera as slow as that. You could shoot with black-and-white film, however, and might want to try this. In general, the common projector used in movie houses projects 24 frames per second, and the average frame is on the screen for about 1/50 second (although some modern design of commercial projector has increased the length of time that the image is projected, producing a brighter picture). This means that if you were to make pictures with a movie camera at 1/24 second you might not synchronize with the shutter of the projector and, as in still photography off the screen, you might show nothing but a blank screen or show only part of the screen illuminated. So it's important to see that your exposures are long enough to catch the full illumination of the movie screen. I'd suggest you shoot at speeds of 12 or 8 frames per second if you're going to try this.

Incidentally, if and when some of these new faster color films are produced in home-movie camera sizes, you'll probably be able to do well with your f/1.9 lens. As to whether you should shoot with Daylight or Type A film, you'll probably not mind the effect you get with either, although the arc lights used in standard commercial movie projectors have a color temperature of around 5200 K, so daylight film might give you a truer and less blue rendition.

Questions of general interest to the color photographer will be answered in this department. However, individual replies can not be given for questions that are not used.—Ed.

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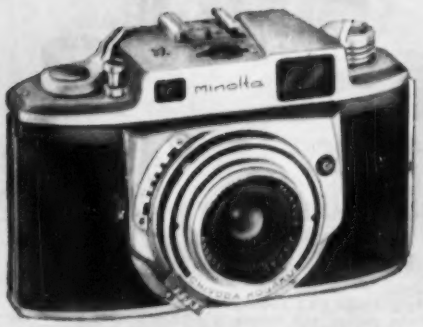
HELICAL FOCUSING LEVER, actuated by index finger of hand supporting camera, sweeps focus from 3 ft. to infinity in a single stroke. Automatic film transport advances film, counts the exposure, and sets shutter. TAKING LENS is ROKKOR 75mm F/3.5, 4-element, highly color corrected and coated. VIEWING LENS is ROKKOR 75mm F/3.2, 3-element, fully coated. OPTIPER MX PRECISION SHUTTER, synchronized at all speeds from 1 second to 1/400th and bulb, with built-in self timer and safety-locking body shutter release. Takes 12 2¼" x 2¼" exposures on standard 120 color or black-and-white film. ..... LIST $99.50



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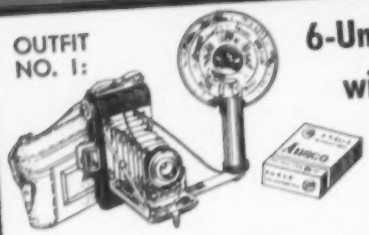

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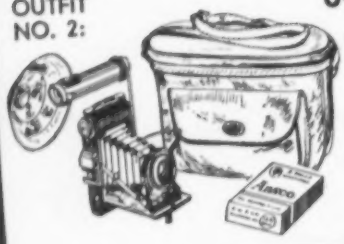

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Agfa Agnar f/4.5 zone-focusing lens. Self-timer shutter; speeds to 1/200th sec. Body shutter release for smooth shooting. Optical finder and accessory shoe. 8 large pictures to a roll. **Complete** with roomy gadget bag, flash unit and 3 rolls of ANSCO All-Weather film.

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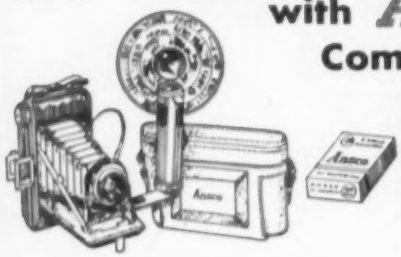

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ANSCO folding cameras are ultra-modern and streamlined. They GET MORE PICTURES . . . because they are compact enough to go ANYWHERE. Touch a button and your ANSCO camera snaps to attention—ready for instant action! Yet every ANSCO camera shown here uses popular 120 roll film for large-size album prints. All are products of world-famous Agfa Camera Werk, Munich, Germany. Eveready cases and film are by ANSCO, U.S.A. Luxurious gadget bags and flash units are exclusive D.F.A. (not Ansco) products. Every unit is top-notch. All function together as a smooth team, giving you perfect pictures every time!

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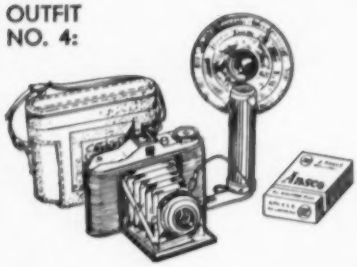

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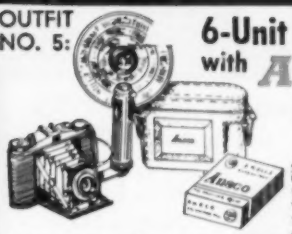

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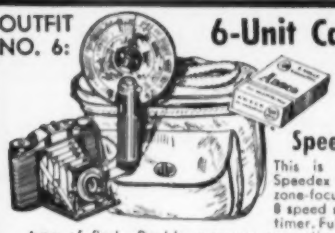

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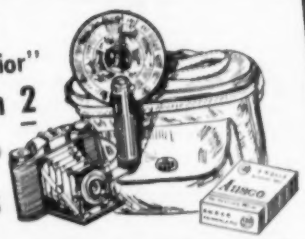

Now you can treat yourself and treat Junior too! Imagine: You'll receive the **complete** ANSCO Viking Readyset Outfit No. 1 AND the superb, **complete** ANSCO Speedex Special "R" Outfit No. 6! A total of 12 units: 2 fine cameras; 2 flash units; Viking case; Speedex Special "R" gadget bag; and 6 rolls of ANSCO All-Weather film! Yours will really be a "photographic" family! (BOTH outfits complete!).

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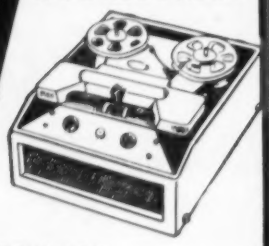

The CLIPPER
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Regularly $129.50. Now, from D. F. A., only $99.50.
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MIGHTY LIGHT Standard AC Unit	$44.95 Cash or $4.49 Down
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Inquire also about MIGHTY LIGHT Slave Units!

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Uhler 16mm Sound Cine Printer! (illustrated)

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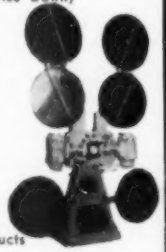
Uhler Combination 8mm and 16mm Continuous Printer ▶ (illustrated)



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Here's but a short list of some of the Voice of Music's "ear openers":

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- **Woofer-tweeter speaker system**
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For the inside story on the feature-packed VM Tape-o-Matic Recorder write to DOWLING'S Fifth Avenue for FREE brochure **today!** Or—if you have a special recording or hi-fi problem—please feel free to write for personal advice to our audio consultant, Ralph Thomas.

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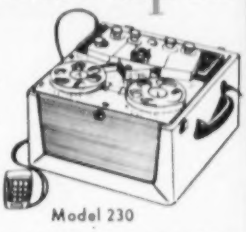

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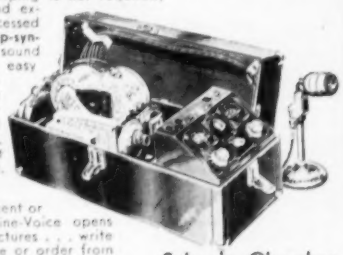

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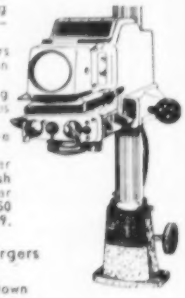

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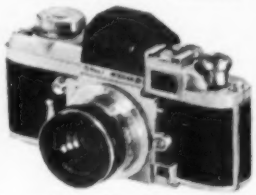

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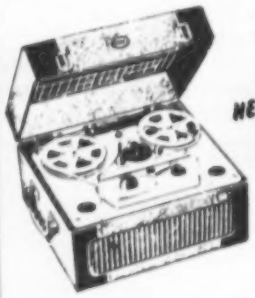

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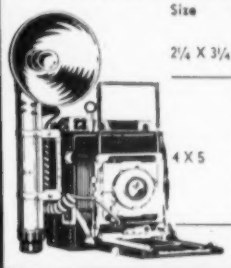

Size	Coated Lens in Shutter	Speed Graphic	Crown Graphic
2¼ X 3¼	101mm Ektar f/4.5 (1/800 sec.)	$338.	$300.
	105mm Tessar f/3.5	355.	306.
	105mm Ektar f/3.7	343.	294.
4 X 5	135mm Schneider Xenar f/4.7	337.	291.
	135mm Optar f/4.7	354.	305.
	127mm Ektar f/4.7	354.	305.
	135mm Tessar f/4.5	370.	326.
	150mm Schneider Xenar	381.	334.
	150mm Tessar f/4.5	381.	334.
	152mm Ektar f/4.5	371.	327.
	135mm Schneider Xenar f/3.8	388.	344.
	150mm Tessar f/3.5	448.	400.
	150mm Schneider Xenotar f/2.8	568.	524.

New Graphic rangefinder is manufactured for 4 X 5 cameras only. 2¼ X 3¼ outfits are supplied with Kalart coupled rangefinder.

New 1956 Revere 888

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Fabulous! Weighs 2½ ozs.; 3" long. Automatic transport takes 50-exposure film. Built-in flash; 9 speeds to 1/1000th sec.; sharp f/3.5 lens. With case and chain **$139.50 Cash or $13.95 Down.** Accessory reflex finder **$27.50;** right-angle finder **$14.95.**

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With fully automatic diaphragm lens listed: Tessar f/2.8 **$259.50 Cash or $25.95 Down;** Westagon f/2.0 **$289.50 Cash or $28.95 Down;** Biotar f/2.0 **$345. Cash or $34.50 Down;** Xenon f/1.9 **$351.70 Cash or $35.17 Down.** With Pentaprism R/F add **$47. Cash or $4.70 Down.**

ALL NEW 1956 RETINA IIIc

Built-in exposure meter and with normal Xenon coated f/2.0 lens in M-X shutter—**$190. Cash or $19.00 Down.** Optional: Curtar 35mm coated f/5.6 wide angle lens **$62.50 Cash or $6.25 Down;** Longar 80mm coated f/4.0 telephoto lens **$82.50 Cash or $8.25 Down.** Retina IIc **$135. Cash or $13.50 Down.**

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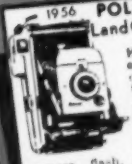
4 X 5 model with multifocus rangefinder, universal back and 150mm Xenar coated f/4.5 lens **$419.70 Cash or $41.97 Down.** Linhof 2¼ X 3¼ outfit with multifocus rangefinder and 3 lenses complete **$564.15 Cash or $56.41 Down.**

1956 POLAROID Land Cameras



Highlander Camera only $89.95 Cash or $6.95 Down. Complete Highlander outfit: camera, flash, meter, case for outfit, and 3 rolls of film only $97.50 Cash or $9.75 Down! Speedliner $89.75 Cash or $8.97 Down; Pathfinder $249.50 Cash or $24.95 Down.

1956 HASSELBLAD Model "1000-F"

—superlative 2¼ X 2¼ single lens reflex with crisp Ektar coated f/2.8 and speeds to 1/1000th sec.: **$379.50 Cash or $37.95 Down.** NEW Super-wide Model with 38mm Zeiss Biogon coated f/4.5 lens **$489.50 Cash or $48.95 Down.**

NEW Models 1956 Rolleis

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new BOLEX H-16 Supreme

New model . . . just released! Complete with 3 top Kern lenses: Switar 1" f/1.4, Switar 16mm f/1.8, Switar 50mm f/1.4—plus compartment case **$824. Cash or $82.40 Down.** Bolex H-16 Leader with Lytar 1" f/1.9 lens **$269.50 Cash or $26.95 Down.**

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Top-quality Olympic 8mm turret camera with normal f/2.5 lens, Kinotar wide angle f/2.5 lens, Kinotel telephoto f/3.5 lens, latest Brockway M-3 exposure meter, plus roll 8mm Kodachrome film. **Complete $139.50 Cash or $13.95 Down.**

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camera clubs
by Whit Hillyer

The Care and Feeding of Prospective Members

Many of us have made one or two false starts before finding the camera clubs we wanted. There are three fairly common variants of this difficulty. The simplest version is when you go to a meeting or two and are so bowled over by the excellence of the members' work that you figure this group is way out of your league and you shouldn't waste their time. Another twist is that you go for a while and submit prints or slides or movies and realize that these folks are either too polite or too uninformed to furnish the stimulus you need. The third oft-used script is the one in which you go and enter work and have it ripped to little pieces by the nonconstructive criticism of one or more opinionated lightweights.

All three routines have frightened hundreds of potentially active folks away from this club or that one. And correcting these evils has its pitfalls, too, such as lowered artistic or technical standards and insincere flattery.

Kalamazoo Camera Club's "Photo Digest" not long ago offered some pertinent comments on this general subject. By way of getting this month's seminar started, let me quote from the *Kalamazoo* piece:

"Probably the most frequent criticism of our club is . . . that we scare away new members . . . that our photography is too good for a beginner to compete with. Of course, this is nonsense, as all of us know who look at our prints and slides week in, week out. We do have a few uncommonly good photographers—but the ordinary stuff most of us turn out is not very good, and we are the first to realize it. . . .

"Because we are trying hard to improve, we are fierce critics of our work and everyone else's. Our discussions are uninhibited. . . . Let's invite our visitors to come back after the first rude shock of their first visit, to find out for themselves . . . that we are really attacking or defending ideas and viewpoints, not our fellow members.

"But above all, let's not curb our speech —or lower our standards—to win popularity. What we need is more honesty and higher standards than we have yet achieved. . . ."

Nicely put, Kalamazoo. I'm happy to relay the foregoing sentiments for the good of the order. One additional word, though. People are different—some are naturally gentle souls, some thick-skinned. You can soon get to know who is which. Just make sure the sensitive ones are made to understand there's nothing personal about good photographic criticism. You usually can find *something* good to say about a picture by way of taking the sting out of a roasting.

A little care may develop a salon winner in your midst.

This year's Miss Photo Fiesta title was won by Sue Loveless, posing here in Redlands Camera Club's (her sponsor) seashore setting at the Fiesta. Photo was taken by Redlands' Stan Shuttleworth.

Drop These Clubs a Line

Since last we met, quite a number of clubs have written in to express a desire for correspondence. Here are the names and addresses:

Katy Railroad Camera Club, c/o Milton E. Roebke, 3506A McKean Ave., St. Louis 18, Mo.

The Shutter Club, Church Farm School, Box 662, Paoli, Pa.

Milford Camera Club, Inc., Charles B. Duncan, secretary, 42 High St., Milford, Conn.

Darien Camera Club, c/o Burtt Dutcher, vice president, 18 Edgerton St., Darien, Conn.

We hear that *Norwalk* (Calif.) *Camera Club* has grown from a membership of eight to over twenty within a year. Held their own club beauty contest, too, in conjunction with local merchants, and took their beauty queen to the Redlands Photo Fiesta. She didn't win first place, but she was quite a gal.

Ted Brautigam has advised me of *Fort Dearborn-Chicago Camera Club's* evening school of photography, to consist of 10 Tuesday night sessions. This is a real deal for Chicago Loop workers. Only $15 for the entire course. Sessions start at 7 P.M., enabling everybody to get home at a decent hour.

Is your club on our mailing list? If not, please send name and address to: POPULAR PHOTOGRAPHY, Department 307, 366 Madison Ave., New York 17, N. Y.

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8mm camera makes movies as easy as snapshots

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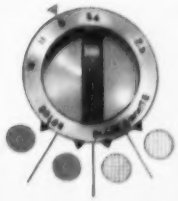


When you dial the sun, you're set to shoot!

Features found in no other camera make the Wilshire (and its faster-lens mate, the Monterey) easiest to use. Exclusive Sun Dial, huge viewfinder, wide angle lens make sharp, clear pictures a cinch!

Monterey (with f/2.3 lens)..... **$59.95**

AUTO-8 VOYAGER
8mm Magazine Camera

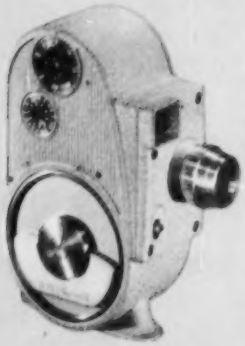
Who wouldn't be proud to give, delighted to get a beautiful magazine camera like this? Loads in 3 seconds! Five speeds, including slow motion, built-in exposure guide, interchangeable f/2.5 lens. Fits into pocket or purse.

$134.95

AUTO-8 EXPLORER with the same standout features, plus 2-lens Swifturn turret.

$169.95

COMPANION
8mm Movie Camera



So reasonably priced, yet chock full of de luxe features! Pocket-size and so light weight it's a perfect traveling companion. Drop-in spool loading, built-in exposure guide—actually *easier* to use than a still camera. Four speeds, 0.5 inch f/2.5 lens.

$79.95

AUTO LOAD 16mm Magazine Camera

Happy days ahead for the one who gets this beautifully designed 16mm magazine-load camera! Remarkably compact, yet packed with features — 3 second loading, 12½ ft. film run, built-in exposure guide, 5 operating speeds. Precision built by Bell & Howell to make needle-sharp movies in black and white or color. 1-inch f/2.5 lens.

$174.95

Great gifts for giving
Great gifts for getting

BY

Bell & Howell

CHECK THE STAR FOR GIVING

CHECK THE BELL FOR GETTING

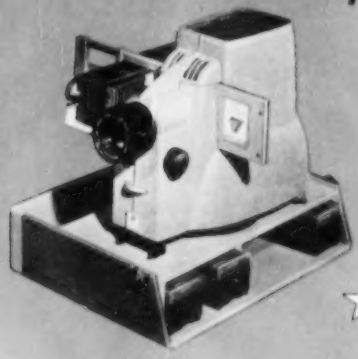
TDC HEADLINER 303
35mm Slide Projector

Introduced only recently, it's already a "best seller." Just look at the low price! And features! Everything to bring out the full brilliance of 2 x 2 color slides — 300-watt lamp, blower cooling, SELECTRON-Semimatic slide changer with 30-slide Selectray, coated 4-inch f/3.5 helical focusing anastigmat lens. Mounted in Carrymore Case..... **$54.50**

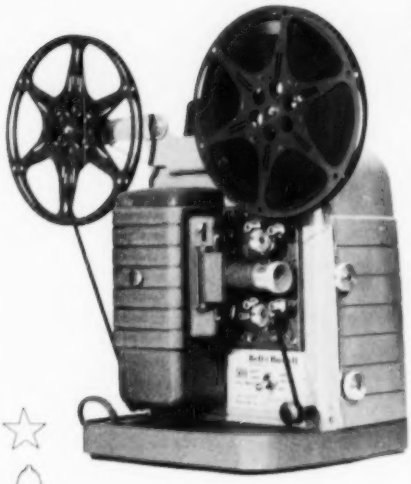
STREAMLINER 500
35mm Slide Projector

A bright idea for Christmas — the extra brilliance of this 500-watt projector. Wind-Tunnel Cooling, Airflow case, SELECTRON changer, gear focusing, coated 5-inch f/3.5 lens.

$79.75

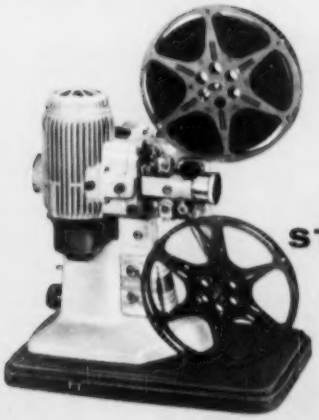


MONTEREY 8mm Movie Projector



WAS $99.95
NOW $79.95

A bargain price and what a value! Famous Bell & Howell quality is built into this easy-to-operate projector. Anyone can run it. Brilliant 500-watt lamp, 400-ft. film capacity for a 30-minute show, fast power rewind — everything to make it fun to show 8mm movies. 1-inch f/1.6 lens, die cast aluminum case, swing-out lens mount for easy threading.



STATESMAN 16mm Projector

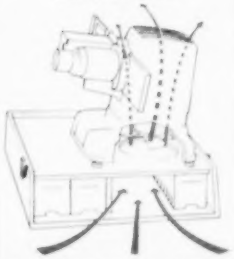
Picture the pleasure this fine, flicker-free projector will bring *this* Christmas, and for years 'n' years! Bright, larger-than-life movies, sharp and clear. Full 400-ft. film capacity. Still picture projection and reverse. Easy to operate. It's lightweight, portable, with handsome snap-on case. **$199.95**

STOCKING GIFTS

For movie fans — Bell & Howell "touch threading" reels. 8mm and 16mm reels from ..... **60¢**
Sturdy cans from ..... **60¢**

For 35mm fans—TDC Prestomount 2 x 2 slide mounts, optical glass protection, sealed in metal. Package of 20 **$1.85**

WIND TUNNEL COOLING
SAFEGUARDS SLIDES



Steady stream of cool air sweeps upward. AIRFLOW CASE holds projector, changer, selectrays.

DELUXE MODEL D 35mm Slide Projector

Compare the precision. Compare the performance of this 300-watt, Wind-Tunnel cooled projector and you'll see why it's the buy for giving and getting! Whisper-quiet VENTURI Blower keeps slides safely cool, roller bearing focusing, SELECTRON-Semimatic Changer, coated 5-inch f/3.5 anastigmat lens. **$74.75**

NEW TDC HEADLINER 35mm Slide Projector

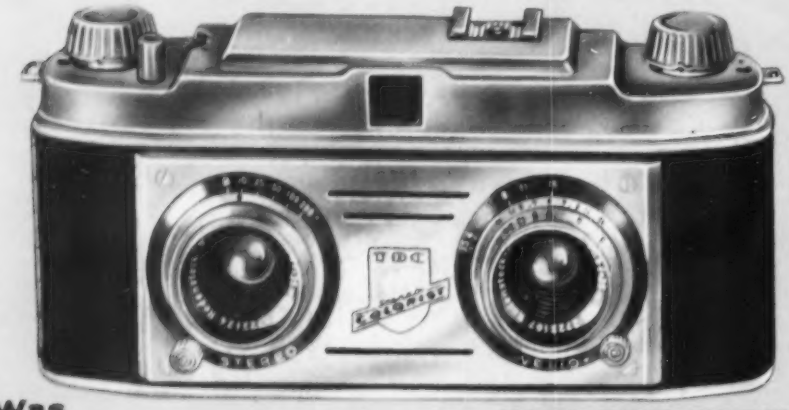
What a break for Santa! This new top-quality TDC projector at a sensational low price — only $39.95! Yet it's jam packed with wanted features. Blower cooled. Deluxe manual changer. Also accepts SELECTRON-Semimatic changer and 300-watt lamp. With 5-inch f/4 lens and 200-watt lamp . . . only **$39.95**

Give the gift with a future

Bell & Howell

TDC Stereo Colorist

Price reduced in time for Christmas!



Was $84.50 Now $69.50

A sensational value at the old price — now an *unbeatable buy!* "Deep Focus" makes it easy to get sharp, real-as-life 3-D pictures. Double-exposure prevention. Synchronized for all flash. Rugged die-cast aluminum body. Gauthier shutters with matched f/3.5 lenses. Capture Christmas in 3-D at a saving.

see these gift ideas

at your **Bell & Howell** *dealer*

STEREO VIVID PROJECTOR

It's a proud Christmas for the family that gets this brilliant 3-D performer. It's tops! Twin 500-watt light system. (750-watt system optional.) Coated f/3.5, 5-inch matched lenses.

$149.50

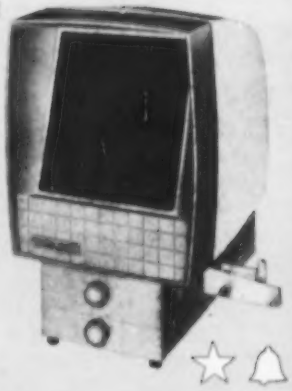
MIRACLE 2000 TAPE RECORDER

Now's the time to join the thousands who've discovered the fun of tape recording music, voices, favorite programs. And do it right — with this miracle of fidelity. *Four speakers* complement each other to reproduce the entire tonal range. Smart, mahogany cabinet. **$299.50**

TDC STEREO TABLE VIEWER

Here's easy viewing! Throws 3-D pictures on big 72-sq. inch black viewing glass. Twin 3-in. f/2.8 coated anastigmat lenses. 300-watt lamps, blower cooled. A dramatic gift!

$119.50



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Bell & Howell

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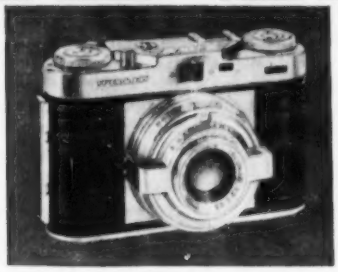
captures famous dance team

Mr. and Mrs.

ARTHUR MURRAY

doing the Cha-Cha!

EDIXA



THE EDIXA RANGEFINDER MODEL C is the only popular-priced 35-mm camera with all • these • features in *one* camera, and which sells for *under* $50! You would expect these features only in high priced, expensive cameras! • Automatic Rapid-Winding Lever—a flick of your finger on the lever permits you to take a series of shots in seconds. • Fast F/2.8 color corrected lens gives you pictures that are razor-sharp, in color and black-and-white. • RANGEFINDER is automatically coupled and scientifically balanced to assure pin-point sighting and focusing. • Chronometer-accurate shutter has speeds to 1/200th for action. • Built-in self-timer permits you to step into the picture. • Built-in flash for flash-bulbs and strobe flash. • Double exposure prevention built into camera. • New wide sweeping optical viewfinder gives you a picture-window panoramic view of your subject. • Unparalleled precision micrometer-geared film frame counter automatically shows number of pictures exposed. • The Edixa is custom finished in black morocco leather and satin chrome.

EDIXA COUPLED RANGEFINDER MODEL C with Rapid-Winding Lever, F/2.8 Color Corrected Lens, Pronto Shutter with speeds to 1/200 second, Self-Timer and Built-in Flash.....only **$49.95**

See this New EDIXA RANGEFINDER MODEL C camera at your local dealer or write for colorful brochure.

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A round-up of recent developments and significant trends

No More Wattseconds? The fact that the watt-second input rating of electronic flash units is less important than the measured light output in determining accurate exposure guide numbers is gaining widespread recognition through the article *Exposure with Portable Electronic Flash Units* published in *Kodak Photo Notes* No. 2, 1955. This is the 8-page bulletin mailed periodically to registered owners of the *Kodak Reference Handbook* and the *Kodak Photographic Notebook*. Though admitting that "wattseconds" is not entirely meaningless as an indication of light output, the article goes on to suggest electronic flash guide numbers for various Kodak films (both color and black-and-white) based upon the "effective candlepower seconds" (ECPS) output of the unit. Unlike beam candlepower seconds (BCPS) which is concerned only with the intensity of the light along the lamp axis, ECPS represents an integration of the light intensity over the picture field. The Kodak article suggests that electronic flash unit manufacturers may either publish the ECPS output of their equipment or supply it on request. The method for measuring and weighting the light output at various beam angles to derive a single figure for ECPS is specified in American Standard PH2.4—1953—for exposure guide number determination. It is interesting to note that even this method is being subjected to close scrutiny on the grounds that the coverage angle, 40 degrees of arc, isn't wide enough to cover the field of most normal-focal-length camera lenses.

PA of A Convention. The 75th Anniversary of the Photographers' Association of America was celebrated this past August 14 through 19 with one of the liveliest conventions and most interesting trade shows in the organization's history—at Chicago's Conrad Hilton Hotel. In addition to special events commemorating the Anniversary, there were the usual five-day programs of the Professional (portrait) and Commercial divisions of the Association as well as a two-day Photo Journalism Short Course, a feature instituted at the 1954 PA of A Convention. Most significant of all were the extension of the convention's third National Industrial Photographic Conference into a five-day event and the decision of the Association to organize an autonomous industrial division. The pro tem officials of the new national group are: chairman, Richard C. Kinstler (Proctor & Gamble Co., Cincinnati); Vice Chairman, Eastern Region—Peter Carey (Bendix Aviation Co., Teterboro, N. J.); Vice Chairman, Central Region—Norman Germond (Chrysler Corp., Detroit); Vice Chairman, Western Region—Roy L. Wolford (Northrop Aviation, Inglewood, Calif.). Here for the first time is an opportunity for the tens of thousands of photographers whose day-to-day endeavors facilitate the production, research, and sales efforts of American "industry" to identify themselves with a strong national organization that is getting ready to serve their unique professional interests.

The PA of A trade show was a "must" if only for the opportunity it gave us to take a long close look at Kodak's two new color-printing papers about which we ran a "stop-press" report on page 110 of the November issue of POPULAR PHOTOGRAPHY. It was equally rewarding, however, in the assortment of new, functionally designed processing equipment that was offered and in the ingenious shooting and lighting equipment introduced.

COLOR MATERIALS. In addition to the introduction of **Kodak Color Print Material Type C,** for prints from Ektacolor and Kodacolor negatives and **Kodak Color Print Material Type R** for prints from positive color transparencies, the trade show saw the introduction of the sheet-film version of the new fast **Anscochrome** color film, of 36-exposure **Minox loads** of Anscochrome, and also of the **Dyco Color Print Kit** for making inexpensive color prints in home darkrooms by a simplified separation system. . . . Anscochrome sheet film comes in a daylight-type emulsion rated at 32 (ASA equivalent) and in a 3200 K tungsten type, rated at 16. Ten-sheet packages range in price from $3.95 for the 2¼x3¼-inch size to $28.30 for 8x10—with processing done by the individual photographer, by commercial laboratories, or by the Ansco laboratory in Binghamton, N. Y., at extra cost. Minox rolls of Anscochrome are priced at $1.95 (processing extra) by Kling Photo Supply, New York . . . The Dyco Color Print kit, including 10 sheets of printing paper and chemicals for making at least six prints by the unique process which was described in T&T for June 1955 is priced at $14.95.

PROCESSING EQUIPMENT. One of the highlights of the Eastman Kodak exhibit was a processing system employing "nitrogen-burst agitation" to keep fresh solution moving past the surfaces of the film or paper during the developing cycle. At regular intervals, a measured quantity of chemically inert nitrogen gas is vigorously bubbled through the developing tank from a grid-shaped gas (or water) distributor with evenly spaced holes, which is placed at the bottom of the tank. The distributor is connected to a cylinder of compressed nitrogen gas by means of two small inlet tubes. Kodak considers this system superior to the use of moving vanes or to the lift-and-drain method for producing uniform results in color as well as black-and-white processing. Processing systems utilizing nitrogen-burst agitation were also introduced at the trade show by the **Pako Corporation** and by the **Calumet Manufacturing Company** of Chicago. Oth-

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... the Beseler Enlarger helps make them

MODEL 45M

(16mm to 4" x 5"). Net Price: 198.75 with Motor and Lifetime Guarantee (207.75 From Denver West)

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Great pictures are all around us. We must learn to "make" them. Good photographic equipment cannot help us see into the subject, but it can help us *interpret our feelings*, giving us the freedom to create *exactly* what we want.

An Enlarger should obey the creative photographer's slightest demand, helping him fulfill his potential. *The Beseler Enlarger* is designed by photographers, engineered to extremely rigid specifications. Consider the automatic electric controls, lateral lamphouse movement, built-in sliding filter drawer, 90° horizontal projection, rigid triangular truss framework, one set of condensers for all negatives. Beseler offers *7 Major Contributions to help us make great pictures*—contributions never before found in any other enlarger.

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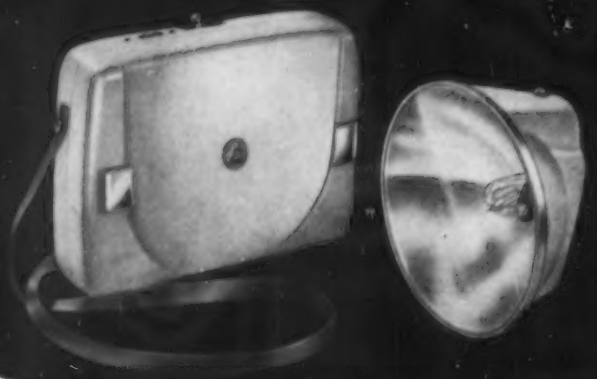

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	WEIGHT	KODACHROME GUIDE NO.	NO. OF FLASHES	COST OF BATTERIES	BUILT-IN AC OPERATION	PRICE
FR	2½-lbs.	40-50	300	80¢	YES	$54.95
"A"	4-lbs.	45	1200	$20.00	$20 more	$ 89.50
"B"	5-lbs.	40	1000-1500	$16.00	$60 more	$110.00
"C"	4-lbs.	35-50	1000-1500	$16.00	$21.50 more	$110.00
"D"	3-lbs.	30	300	.80	$28.50 more	$ 79.50
"E"	5-lbs.	30-45	1000	$ 8.00	No	$ 79.50
"F"	4-lbs.	50-60	1000-1500	$16.00	No	$ 99.50

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ers expect to follow in the near future.

In view of the vigorous interest in color processing arising from the introduction of high-speed Ektachrome and Anscochrome films earlier this year, it wasn't surprising to see a rather large variety of color-processing units offered by the various exhibitors. In addition to the professional-type units introduced by Pako and Calumet, **Leedal Stainless Steel** of Chicago introduced a pair of self-contained laboratory units for Ektachrome and Anscochrome respectively (in the under-$1,000 range). **Grafic Stainless Steel** of Chicago supplemented their line of color equipment with developing racks for Nikor reels and with a 3½-gallon instant-dump tank that empties its solution in 8 seconds or less. Grafic developing racks take either 18 No. 120 reels or 36, 35-mm reels and are priced at $36.70 and $32.20 respectively; they both fit the company's 65 P, 3½-gallon processing tank. . . . Of greater interest to the amateur or to the occasional color worker was the **BFi (Brown-Forman Industries) 7-Minute Processor.** Designed primarily for developing black-and-white roll and 35-mm film in BFi's new high-speed finishing solutions, the outfit is specially handy for color-film processing. Priced at $23.75 (including the six chemicals comprising the B&W process), the processing unit consists of a 15-inch-diameter polystyrene-plastic water jacket in which seven plastic tank cups (holding 16 fluid ounces) mounted on a cup-holder plate, are immersed. The removable and rotatable upper section of the unit incorporates a raised turret in which a retractable film reel is mounted. (The reel is adjustable for all film widths from 35-mm to 616.) After the reel has been loaded with the particular color film, it can be successively immersed in each of the 6 or 7 color-processing solutions contained in the various tank cups of the unit. The transparent reel flanges permit the film to be flashed with white light for the reversal exposure without unloading the film from the reel. . . . Apropos of stainless-steel tray and tank structure, it is interesting to note an increasing use of welded rather than soldered corners and joints—a feature which we first noted in evaluating the Bar Ray photographic processing equipment line several years ago.

A great deal of interest was shown in a new line of **"Kreonite" professional darkroom sinks** and **print washers** introduced by Kay Dee Products, Wichita 8, Kansas. Made of a glass-fiber-reinforced plastic, this equipment is light in weight, finished in a variety of attractive pastel colors, and apparently strong and resilient. Prices are moderate, with the 5-inch-deep 36x37½-inch utility sink listing at $145.

DARKROOM EQUIPMENT. A completely automatic enlarging easel introduced by the Pic-tronic Co. of Gary, Indiana, the **Pic-tronic Timer,** uses an electronic "eye" to measure the intensity of the printing light that passes through the paper. An electronic powerpack which is adjusted to the sensitivity of the paper in use integrates the light signal and automatically turns the enlarger light off when the correct exposure time has elapsed. The unit

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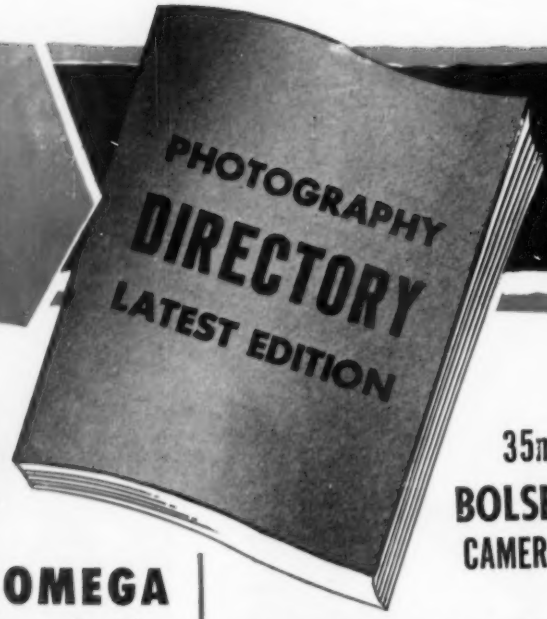

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Automatic Diaphragm
With Telephoto Lens
USED $117.50

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2¼x2¼ Reflex focal plane shutter, Ektar F:2.8 ctd. preset. 'MX' synch., Used..... $199.50

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H-16 Loader, F:1.9 ctd.	$146.00
H-16 Deluxe, F:1.9 ctd.	189.00
H-8 Loader, F:1.9 Ctd.	142.00
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Bellowscope	13.95
Exa. F:2.9, used	43.50

4" Cooke F:2.2 tele-lens $84.50

$94.50

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portable 35mm enlarger with built-in color head....$94.50

Compare this Omega enlarger feature by feature and you will see why it becomes a once-in-a-lifetime investment.

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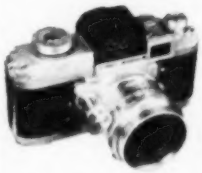
ALPA VII

35mm Reflex



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- built in Multifocal viewfinder
- Prism reflex and rangefinder focusing
- Single knob for winding and shutter setting
- Speeds from 1 to 1/1000
- Built in flash and strobe synch.

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4x5 Crown F:4.7 Rfdr., brand new **$163.00**
Ann. Speed With Rfdr. Flash

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B&H 'Regent' 500W, case	179.95	102.75
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Contax II Sonnar F:2	.....	77.50
Contax IIA, Sonnar F:2	336.00	138.50
Contax IIIA, Sonnar F:1.5	412.00	189.50
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Retina IIA, F:2 ctd. autom.	127.50	69.50
Retina IIIC F:2 synch.	190.00	116.00
Revere Stereo F:3.5 synch.	174.50	73.25
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Robot 'Royal' Xenon F:1.9 Rfdr.	293.00	136.50
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Zeiss Super D, Biotar F:2	.....	89.50
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21mm Biogon F:4.5 W.A. 90°	249.00	159.00
28mm Retrofocus F3.5	120.00	72.00
35mm Elmar F:3.5 W.A.	.....	43.50
35mm Summaron F:3.5 W.A.	96.00	57.25
35mm Nikkor F:3.5 W.A.	97.50	54.75
35mm Biogon F:2.8 W.A.	.....	78.50
35mm Retrofocus F:2.8 W.A.	99.50	56.95
40mm Cassaron F:3.5 W.A.	49.50	24.00
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90mm Elmar F:4, Chrome	90.00	57.50
135mm Nikkor F:3.5	145.00	69.50
135mm Hektor F:4.5	135.00	63.95
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$2.95 Value Special..... **$1.98**
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BRAND NEW
with Xenar F:3.5 ctd. **$138.50**
with Tessar F:3.5 ctd. **$148.50**
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Your present lens adapted $10.50
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- Color-Skopar F:3.5 ctd.
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- Built-in Selftimer

Reg. $54.50 ..... **$28.50**
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SAVE $33.50
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16mm Movie Camera 100 foot roll capacity 2.5cm coated lens.
BRAND NEW... **$43.50**

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6x30 center focus.... 17.35
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A powerhouse of light energy (80 W/S)—priced within easy reach of every amateur! Uses 5 "D" cells, or 110V A.C., to give a guide of 55 to 65 with daylight Kodachrome. Lifetime flash tube; a mere 4 lbs. This value knows no equal!

ONLY $69.95 less batteries

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Newest top-quality Ultrablitz, offers 75 to 85 daylight Kodachrome guide (120 W/S) with choice of 4 Volt storage battery or 2 - 240 Volt dry batteries (Model 480-S). Weighs a mere 5 lbs., lifetime flash tube, operates on 110V A.C. as well.

EITHER MODEL $99.95 incl. batteries

HERE'S THE WORLD'S MOST POWERFUL PORTABLE UNIT!

REPORTER I

Imagine a portable unit, weighing a mere 9½ lbs., with a guide number of 90-100 using daylight Kodachrome (225 W/S). And with its accessory booster ($79.50), shoot with 120 guide (450 W/S)! Operates on all A.C. voltages, or with its storage battery. Charger built-in, too! Photo cell ($26.95) converts for slave operation.

ONLY $194.50 incl. batteries

Extension flash units:

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is priced at $269.50 . . . Simmon Brothers announced three new additions to their famous Omega enlarger line at the trade show—the **Automega E-5**, an autofocus model for 2¼x2¼ to 5x7-inch negatives priced at $265 with Omegalite (Circline fluorescent tube) head and the **Automega B-7** and manually focused **Omega B-8**, both designed for negatives from 35-mm up to 2¼x3¼. These are priced at $134.50 and $109.50, respectively, with incandescent lamp-condenser heads . . . Enlarging easels for making duplicate prints on a single sheet of enlarging paper were introduced by **Repeat Easel Products** of Brooklyn, N. Y.—a unit capable of making up to six 2½x3½-inch prints on a 15-inch strip of paper, at $57.50; and also by the **Saunders Company**, Rochester, N. Y.—for making eight 2¼x3¼, four 4x5, four 3½x5, or two 5x7-inch prints on a single sheet of 8x10-inch paper, for about $40 . . . Saunders also unveiled a new **borderless easel** for all print sizes between 2¼x3¼ and 11x14 inches at the same price . . . George Murphy, Inc. introduced a black, completely **baffled metal ventilator** for darkrooms, 12x24 inches and 7 inches thick, for $15 . . . Lektra Laboratories, Inc., New York, previewed their two new large **visible timers**—a model for paper developing calibrated from 0 to 5 minutes priced at $25, and a film model calibrated from 0 to 20 minutes at $45—both giving a bell signal every minute and a buzz at the end of the preset time interval . . . Lenz Washer Co., Lebanon, Mo., introduced a line of **Hi-Speed photo print washers** ranging from a 24-inch-diameter model for $120 to a 48-inch model for $264 . . . **Ansco-Ardura** double-weight printing paper made its debut, a high-speed normal-contrast chlorobromide type, suitable for warm as well as neutral-tone-image development, particularly for the portrait specialist . . . Du Pont unveiled **"Varilour"** a semi-warm tone version of their Varigam variable-contrast paper which is claimed to cover a contrast range from #0 to #3 with the Du Pont 10-C set of optical printing filters . . . Photo Concentrates, Inc., Peekskill, N. Y. introduced a pair of liquid concentrates for stabilization processing of prints—**Developer Solution "A"** and **Stabilizer Solution "B,"** the latter taking the place of fixer, hypo eliminator, and final wash bath. The developer, capable of processing 2,500 square feet of material per quart, is priced at $1.35 per quart, $3.95 per gallon; the stabilizer lists at $1.10 per quart, $3.75 per gallon.

LIGHTING EQUIPMENT. American Speedlight Corporation, Middle Village, N. Y. took the wraps off their **Series 500 Ascor portrait speedlight** equipment, which has 200-watt-second power packs that can be operated at 50, 100, or 200 watt-seconds ($345 for the basic unit with 20-inch reflector) and also their **Series 600 high-power portable** equipment which comes in a 500-watt-second model at $448.50 and an 800-watt-second model at $588.50 . . . **Amglo Corporation**, Chicago, introduced their new interchangeable **Champion Speedlight** series. The basic 28-ounce a-c lamphead that plugs directly into 110-volt a-c line is priced at $69.95. The lamphead may be used interchangeably with a 28-ounce 510-volt dry-battery pack ($35); a 3½-pound 450-volt dry-battery pack comprised of two 90-volt B batteries with a vibrator ($39.95), and also a 7-pound heavy-duty dry-battery pack with two lamp outlets incorporated two 225-volt B batteries with a high-low switch for 60- or 120-watt-second operation ($55). A **power doubler** that doubles the light output of the basic lamphead under either a-c or battery operation is available at $24.95. A second Amglo product was the DAC 380, an a-c and storage-battery combination speedlight capable of operating a single lamphead at 200-watt-seconds, two heads at 260, three at 320, and four at 380—priced at $249.50 with one lamphead . . . **Speedlight Center**, New York, offered a new completely sealed nickel-cadmium storage-battery power supply for their Mighty Light unit, consisting of four cells delivering a total of 5 volts, priced at $49.95; also a new D-cell pack operating on four photoflash-type batteries, at $29.95 . . . A newcomer in the electronic-flash field, **Scheibe Engineering, Inc.**, Burlington, Wisconsin offered the **Starliter**, a self-contained portrait unit priced at $240.50 with a 200-watt-second power supply and $180.50 with a 100-watt-second supply . . . **Hauman Instruments** Company, Watertown, Mass., previewed an ingenious **dry-battery revitalizer** for use with their various Hico-Lite electronic flash outfits. Operated by push-button off a-c house current, the unit automatically shuts off when the battery has been completely depolarized.

Natural Lighting Corporation, Glendale, Calif., offered a new horizontal overhead lamp-suspension unit called **Skybar**. A set of three 1⅜-inch anodized aluminum tubes is assembled in the form of a triangular truss and compressed between the opposite walls of the room or set (up to 16 to 18 feet) by means of spring-loaded end sections. The **Grover Versa-Lite Twin** was also shown by this company—a pair of 250-watt, 100-hour sealed-beam aircraft approach lights powered by rechargeable 8½-pound motorcycle batteries with a connecting crosspiece and pistol-trigger switch on top of which a movie camera is mounted.

SHOOTING EQUIPMENT. Graflex, Inc. offered their famous 70-mm Graflex Combat Camera (PP, August 1952) for civilian use as the **Graphic "70"**—priced at $1,850 with a 4-inch Ektar *f*/2.8 lens, five filters, B-C flash outfit and various accessories. They also announced that deliveries of the **Stereo-Graphic camera** would begin on October 1—the $79.50 price including a ready case and flash unit. Another interesting Graflex product was their **Speed Tripod**, which has a 3-direction pan head mounted on a double-extension center column which can be raised to eye level when the tripod legs are fully extended—priced at $19.95 . . . Duba-Matic Camera Products, Wyandotte, Michigan, introduced an interesting attachment for press-type cameras which automatically cocks the shutter whenever the film-holder is removed, preventing blanks and double exposures. The attachment slips over the front of the shutter and is secured to the

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LEICA IIIf

Aristocrat of the 35mm field, the LEICA IIIf is a masterpiece of camera design. Among its many outstanding features:

- Interchangeable lenses
- Built in rangefinder-viewfinder
- Shutter speeds from 1 to 1/1000 second
- Complete flash synchronization
- Exposure counter

LEICA IIIf with 50mm Summicron f/2 lens...$336.00

LEICA IIf

A Leica camera at a very attractive price, identical with the LEICA IIIf (above) except for extra slow shutter speeds and self-timer. Everything on the LEICA IIf is designed for easy, fast operation—built-in rangefinder ...fully synchronized flash...shutter speeds from 1/25 to 1/1000 second, plus time and bulb. Ask your Leica franchised dealer to show you the remarkable, low-priced LEICA IIf.

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The smallest, most efficient photoelectric meter ever made. Fits into clip on top of your LEICA... can be operated easily with one hand. Accessory booster cell for very dim light...adapters for incident light reading. In sturdy leather cases with carrying chain.

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NIKON

S-2

with everything you'd expect to find in a modern precision 35mm camera

There are certain things you will look for when you select your next 35mm camera. Among them will certainly be the following:

FEATURES • ACCURACY • CONSTRUCTION • PRICE

There may be others, but in all likelihood, most of them fit into these categories. Let's see how the NIKON S-2 'stacks up' on these 4 points—

FEATURES

To start with, the Nikon S-2 is the fastest handling '35' in the field—because it works so smoothly and can be held with one hand . . . three fingers to operate it—the middle finger to focus—forefinger to release the shutter—and the thumb to give the transport lever the one, short stroke that advances the film and 'cocks' the shutter. The Nikon S-2 also has a 1 to 1, lifesize-image rangefinder-viewfinder, combined in one system and viewed through one eyepiece. The fast rewind lever enables you to 'roll back' the film in less than 20 seconds for a full 36-exposure roll. And then there's the positive synch selector that permits perfect synchronization for various flashbulbs at all speeds up to 1/1000th second, and for speedlights at 1/50th. There is more, but let's get on.

CONSTRUCTION

That's a pretty difficult thing to judge unless you 'tear' the camera apart. But, there are some things you can see. For example, the transport and rewind levers are both made of stainless steel. That's the most rugged assurance of long trouble-free service. Now examine the finish of the camera. That tells something of the inside. Note also the fit of the lens in the body—the absence of 'play.' And here are two other facts:- 1. The reflecting elements of the Nikon S-2 rangefinder are gold-surfaced instead of silver—no tarnishing or darkening with age. 2. The Nikon S-2 shutter moves across the plane in 17 miliseconds, making it 50% more effective for stopping action and preventing elongation distortion. And even the tripod socket has been built into the body proper—centered and balanced—instead of being attached to the baseplate.

ACCURACY

We've talked about the rangefinder—but note how it responds to every movement of the lens. That's 'on-the-nose' accuracy where it counts. Much of what has been said of Features and Construction relates to accuracy—the shutter speeds—flash synchronization—frame spacing—never a double exposure unless desired—and the way the film draws across the back . . . evenly . . . because the take-up spool is fixed and aligned in the factory.

PRICE

This is not the least of considerations when choosing a camera and the Nikon S-2 'takes first place' on this count too.

NIKON S-2

with 50mm Nikkor f2 Lens $299.50
with 50mm Nikkor f1.4 Lens 345.00

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NIKKOR

LENSES

the widest selection in the field featuring high speed and high resolution

If asked to name important lens qualities, we are sure that you would place *resolution* and *speed* near the top of the list. And we all know that they assume an even greater importance in 35mm photography. The '35' is traditionally a hand camera with a great deal of the shooting done under available light conditions. This makes high speed lenses especially desirable—and because 35mm negatives are always enlarged—lens resolution is an absolute essential.

The Nikkor lenses were planned for 35mm photography. Special attention was therefore devoted to these two important problems: resolution and speed. Lenses that are sharp when 'stopped down' were always available—but the '35' demands lenses which are equally sharp at full apertures. That Nikkor lenses have achieved this objective is now a matter of record.

Let us go back to the now famous 50mm Nikkor f1.4. It created an almost immediate sensation. Never before had there been a lens of such speed capable of such high resolution. In a very short time, virtually every important 35mm photographer acquired one of these superlative lenses.

Then came other Nikkor lenses—wide angle, telephoto and medium telephoto—each a top lens in its class—and in each, the unmistakable quality that now identifies all Nikkor lenses: high speed *and* high resolution. The world's leading feature photographers were quick to adopt these lenses, as well—and with the same enthusiastic acclaim.

Today, Nikkor represents the largest selection of lenses for 35mm cameras. Thirteen Nikkor lenses are, in fact, available—ranging from an ultra wide angle 25mm to a 10x 500mm telephoto. The improved resolution which these lenses have attained is the cumulative result of many optical factors—better color correction, and an absolute minimum of field curvature, coma, spherical aberration and flare—all the result of superior design and the use of newly developed types of optical glass.

If you use a Nikon 35mm camera, these lenses will provide you with the most effective camera-lens combination ever offered. But even if you use another make of camera, you can still realize the advantages offered by these truly amazing lenses . . . as many 35mm camera owners have already discovered. That is why you'll find so many 35mm cameras—other than the Nikon S-2—owner-equipped with Nikkor lenses.

25mm f4

250mm f4

25mm f4 Ultra Wide Angle	$169.50
28mm f3.5	149.50
35mm f2.5	139.50
35mm f3.5	89.50
50mm f2	125.00
50mm f1.4	169.50
85mm f1.5	299.50*
85mm f2	175.00*
105mm f2.5	152.50*
135mm f3.5	135.00*
180mm f2.5	399.50*
250mm f4	224.50*
500mm f5	550.00*
Reflex Housing (required for 180, 250 and 500mm lenses—interchangeable).	99.50

*Supplied with Matching Lenshood/Filter Holder

NIKKOR lenses are also available in Contax-type bayonet and Leica-type screw thread and mounts.

105mm f2.5

Nikon Cameras and Nikkor Lenses are sold by Authorized Nikon Dealers.

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L-46

FME Model 37-C $139.95

Complete with ceramic microphone, reel of tape and take-up reel, detachable power cord.

- **50-12000 CPS**
- **3¾ and 7½ IPS**
- **Dual track system**
- **Single knob control**
- **Less than 0.5% wow**
- **Separate volume and tone controls**
- **Fast forward and rewind**
- **Radio-phono input jack**
- **Instant stop editing lever**
- **External speaker jack**
- **New ceramic microphone**
- **Straight in-line threading**
- **Recording level indicator**
- **Power pilot light**
- **Erase safety lock**
- **3 hour maximum play time***
- **Accessories available: patch cord, foot control, bass reflex speaker, microphone mixer**

FME Model 47-A $159.50

Complete with ceramic microphone, reel of tape, take-up reel, detachable power cord, patch cord.

Has all the features of the 37-C plus:

- **Reversible automatic counter**
- **Additional output jack for monitoring or Hi-Fi amplification**
- **Special selector lever for fast switch from fast forward to pause to play and record**
- **$3.50 patch cord included**

**With new thin tape*

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tripod socket on the side of the camera body. It is called **Duba-matic Shutter Set** and costs $12.95 . . . **C. P. Goerz American Optical Company,** New York, announced the availability of most of their lenses in Compur as well as Rapax shutters, at approximately $20 less than the Rapax-mounted price . . . Kling Photo Products, New York, introduced a new model of the **Linhof Multi-focus Viewfinder** which provides automatic perspective control at various subject distances in addition to parallax correction. The finder covers the field of all local lengths from 90 to 360 mm and lists at $84. Also announced were the **Linhof DeLuxe Camera Stand** at $299.50 and the **Linhof Attaché Case** for the 4x5 Super Technika, which accommodates the camera, 5 lenses, 12 holders or their equivalent in film pack—at $69.95.

The new **Pic Portable Background Frame** introduced by American Photographic Instrument Co., New York, opens up to 10x10 feet and takes 9-foot-wide rolls of Savage background paper. The unit folds into a portable case weighing 22 pounds; its $84.95 price includes case, and struts on casters . . . And finally, in keeping with the warnings of film manufacturers that color materials must be stored under rigidly controlled temperature and humidity conditions, Oscar Fisher Co., Peekskill, N. Y. introduced the **Fisher Film Storage Vault** available in a porcelain enamel, aluminum, and stainless steel structure at $750 and in an all-stainless-steel model at $1,560.

Card-Weight Verifax Paper. The usefulness of the Kodak Verifax copy reproduction process has been extended by the recent introduction of card-weight Verifax print paper. The new heavy-weight paper is intended for the preparation of Verifax duplicates of existing file cards, the preparation of original file cards from miscellaneous material, and for Verifax reproductions on stock that can withstand repeated handling. A description of the basic process, which produces up to 3 copies of printed or line originals in 60 seconds under normal room lighting, appeared in T&T for July, 1952. The same Verifax matrix paper, available in 8½ x 11- and 8½ x 14-inch sizes, is used with the heavy card stock as it is with regular Verifax paper—the cards merely being arranged on top of the matrix with the copy side down. Five 3 x 5-inch standard library cards can be arranged on the smaller letter-size matrix; six, on the larger legal size. After the usual rapid exposure, development, and transfer operations, the reproduced cards are cut apart ready for use. Best results are obtained on the smooth side of the heavy paper stock, although the grained side also accepts the Verifax image.

Films, 100x Faster! In a speech at the PA of A convention in Chicago last August 17, Donald McMaster, Vice President and General Manager of the Eastman Kodak Co., stated that "An emulsion can probably be made with a sensitivity of four times that of the fastest material now available." Later on, he added:

For a Memorable Christmas!

ZEISS IKON

Made in West Germany

CONTAX
The 35mm camera no professional or amateur will ever outgrow, for its interchangeable Zeiss lenses give it unlimited scope. Speeds to 1/1250. Has auto-focusing rangefinder. The model with built-in exposure meter is called Contax III-a.

IKOFLEX twin-lens reflex with Extrabrite focusing screen and f/3.5 Zeiss Tessar lens. Model I-a has a synchronized Prontor SV shutter with speeds to 1/300. Model II-a has Synchro Compur shutter with automatic film transport and speeds to 1/500.

CONTAFLEX. The most advanced of single-lens reflex cameras. Combines automatic ground-glass and rangefinder focusing. View is seen in full picture size, unreversed, right-side-up. Has Synchro Compur shutter; speeds to 1/500; Zeiss Tessar f/2.8 lens. Two models; Contaflex II with exposure meter.

CONTINA. A new moderately-priced 35mm camera. Has rapid film wind, picture counter, self-timer, depth of field scale and Prontor SVS shutter to 1/300. Model II-a has built-in exposure meter and offers choice of Novar f/3.5 or Novicar f/2.8 lenses. Model I-a, without exposure meter, has Novar f/3.5 lens.

You can be sure your gift will be highly appreciated if it bears the name ZEISS IKON. Smart design, meticulous craftsmanship and superb optical quality have made Zeiss Ikon cameras world renowned.

You'll find models to suit everyone—from the beginner to the advanced amateur or professional—and at a price you would like to pay.

At leading dealers. Write for literature.

CARL ZEISS, INC., 485 Fifth Avenue, New York 17

Spiratone Christmas Shopping Guide

FOR THE DARK ROOM

SAVE 50% ENLARGING LENSES

We are proud to present three unusual values in brand new, coated, color-corrected, anastigmatic lenses, specially constructed to give corner to corner sharpness in enlarging—at prices half and less than those you'd expect to pay for such fine lenses. *Ship. Charge 25c*

2" f.3.8, Leica thread, for 35mm $7.95
3½" f.4.5, clickstops, for 2¼x2¼", 2¼x2¼" 9.95
5¼" f.4.5, clickstops, for 4x5 ..... 19.95

ELECTRIC 2-SURFACE DUO-DRIER

MODEL "B"

WITH 2 12x17 HEAVY DUTY FERROTYPE PLATES AND STAND

$7.95

Yes, Spiratone does it again! A complete, ready-to-use, double surface drier with a capacity of 4 8x10 or 36 2½x3½ prints. Singleweight or doubleweight, glossy or dull finish—simply constructed, yet as efficient as units costing several times as much. Works on AC or DC. *Shipping Weight 10 lbs.*

SINGLE SURFACE DRYER

with 12x17 ferrotype plate, $4.89
Suggestion: Bottle of Ferrotype Polish 20c. Stainless Steel Squeegee Roller 95c

DEVELOPING TANK

ADJ. FOR 35MM, 828, 127, 120, 620, 116, 616.

$1.49

Simple bayonet lock for different size adjustments. Vents for quick changing of liquids. Agitating rod. Easy loading in darkroom — other operations in daylight. Easily worth double. Tank with spare reel, $2.39 *Shpg. Wt. 2 lbs.*

If bought with tank

4 Stainless Steel Filmclips 80c
16 oz. Acid-proof funnel 20c

AUTOTILT PRINT WASHER

All metal 12x15", works in any sink. If bought at same time as any darkroom items of $4.95 and up, only $1 *Shpg. Wt. 3 lbs.*

DECKLE EDGE TRIMMER

$1.00 PPD

It's simple to trim any picture, regardless of size, and obtain a perfect, straight, deckled-edge.

35mm DBL. $26.95 CONDENSER ENLARGER

- Ctd. f.3.8 lens.
- All metal construction, 24" post, 13x16 base board.
- Fine bellows, easy to grip focusing knob.

Never before such a value. Special lamphousing louvres for cooling, glassless negative carrier, plus a double condensing system for extra brilliance, plus a 2" f.3.8 coated enlarging lens—all is incl. in our low $26.95 price.

2¼x3¼ Double Condenser Model with 3½" f.4.5 lens $34.95
Shpd. Exp., Chgs. Collect

SALE ON BRAND NEW GROUND & POLISHED CONDENSERS

	Ea.	1pr. brkd.	2A.pr.
2" (95mm)	59c	2.00	1½ Ib.
3" (2¼" sq.)	79c		2 lb.
4½" (2¼x3¼")	1.00		2 lbs.

ALL METAL 11 x 14 EASEL

INCLUDING FOOTSWITCH

$7.69

- Solid frame guide on 4 sides for proper alignment.
- Spring steel masking bands calibrated in inches and mm.
- Adjustable for all sizes from 5x7" to 12x19".
- White enamelled base.

Extra sturdy (net weight 4 lbs.). Plug enlarger cord into footswitch and you are ready to dodge, vignet and fully control your "blow-ups". *Combined Ship. Wt. 6 lbs.*
8x10 Enlarging Easel, same construction as above, with footswitch $4.98

Save on these new German enlargers! AUTOFOCUS ENLARGERS

35mm model complete with lens—while our stocks lasts, was $60.00 $39.95

2¼x2¼ model, complete with lens, double condenser — while our stocks lasts, was $75.00 $49.95

3 UNIT REFLECTOR OUTFIT $5.49

- Two aluminum 10" reflectors for #1 or #2 bulbs
- One bullet reflector for spot effects

All three complete with swivel joint, switch, socket, clamp and cord . . . at a fraction of their usual cost. *Shipping Weight 7 lbs.*
SUGGESTION: 2 #2, 1 #1 photoflood bulbs 80c.

LUMITROL DIMMER HI-LO SWITCH

Allows for comfortable focusing and composing, without straining subject's eye, saves electricity, life of bulbs, a $6.00 value—only $2.49, if bought with $5.49 set (above) or $6.49 set (below).

PHOTOFLOOD STAND PLUS TWO REFLECTORS

- 3-section metal stand extends 6'4".
- Sturdy, braced legs with rubber tips.
- Stand telescopes compactly to only 2 feet.
- Positive locking at any desired height.

The ideal indoor lighting setup. 22" crossbar, can also be used to hold screen, backgrounds. Two-span aluminum 10" reflectors for #1 or #2 photofloods, complete with sockets, switches, 6' cords, ball socket swivel joints, rubber jawed spring clamps. Can be used on cross bar or furniture. *Shipping Weights: Stand 6 lbs.; Reflectors 4 lbs.*

$17 VALUE $6.98 COMP

Now with new SWIVEL CROSSBAR

SUGGESTION: 2 #2 photoflood bulbs ..... $.80
Extra clamp on bulbs (with ball joint) 1.79
Extra photoflood stand with swivel crossbar 3.00

11x14 TRAYS 3 for $4.19

Made of heavy acid-proof plastic, with reinforced ribs, handy pouring spout. *Shpg. Wt. 10 lbs.* 8x10 Trays 3 for $2.39. *Shpg. Wt. 6 lbs.*

ENLARGER FOCUSING AID

$1.00 A $2.25 value. *Sh. Ch. 15c*

HYPO TESTER $1.00

A hydrometer-type device which instantly shows correct fixing time. Helps eliminate stained prints and wasted hypo. *Sh.Ch.10c.*

STATIC BRUSH

$2.99 if bought with other equipment

Retractable, emits radiactive rays. To clean lenses, slides negatives!

ALL METAL WALL and TABLE SAFELIGHT $2.95

FREE

Comes complete with one filter for enlarging and printing, accepts standard Kodak 3¼ x 4¼" filters (any color—$1.35). Swivels to desired angle with Safelight. Special PANCHROMATIC Safelight Bulb, a $1.00 value! *Shpg. Wt. 2 lbs.*

PRECISION GERMAN CHEMICAL SCALE $3.95

Every photographer knows the savings resulting from 'mixing his own'. This new import is extremely accurate (no springs), is graduated to 250 grams. Cup is removable, two legs turn for flat, compact storage. All metal construction. *Sh. Wt. 1 lb.*

7 PC. ENLARGER ACCESSORY KIT

REG. $9.00 $3.98

VALUABLE TO BEGINNERS AND ADVANCED AMATEURS

Set contains sturdy footswitch, funnel, pair of print tongs, bottle film cleaner, Enexpo Enlarging Exposure Meter which shows required time for any paper directly on chart, regardless of enlargement size, and Teststrip maker which helps check accurate exposure and shows where to dodge. *Shipping Weight 6 lbs.*

FREE WITH SET: Argoo Print Washer, fits faucet, a $3.00 value.

IMPORTED STAINLESS STEEL DEV. TANK $5.95

compl. with 35mm or 120-620 reel

Stainless steel developing equipment has always been preferred by meticulous photographers: it is rust and corrosion-proof, unbreakable, quickly cleaned and dried. The reels are easily loaded. Daylight filling, free circulation, ideal for black and white or color. Extra Stainless Steel reels, specify 35mm or 120-620. *Sh. Wt. 2 lbs.*
Each $2.25 — 3 for $6.00

ENLARGING TIMER

$6.95

60 sec. range, with second markings. Current shuts off automatically at end of desired time interval. Built-in lock holds knob at desired position, until toggle is released. Adjustable stop for repeat exposures. Manual operation for focusing. Enlarger or printer plugs right into receptacle on cord timer. *Shpg. Chgs. 50c.*

CHANGING BAG

ONE OF THE MOST IMPORTANT "TOOLS" OF ANY PHOTOGRAPHER

Double zippered inner and outer bags, made of the finest cloth, make this bag 100% light proof even in brightest sunlight. Whether for use in an emergency, with a film torn or pulled off the spool in a 35mm camera, or for reloading cut film holders or for developing film when no darkroom is available . . . the changing bag is justly referred to as a "portable darkroom". 17"x16" working space plus elastic sleeves.
All these features at the lowest price a quality changing bag that was ever offered at. *Shipping charge 25c.*
PROFESSIONAL MODEL: 27"x20" working space, Q11.50 value! *Shipping Charge 50c.* $3.95 $6.95

Up to 70% off! 2x2 Color-Slides for as little as 3¢! 2 x 2" 10 PC. N'ATL. PICTURE SLIDE SETS

Yes, these famous sets of 2 x 2" full color slides of which hundreds of thousands have been sold at $1.00 per 10 are now brought to you at less than half price! Scenics from all over U. S. and many foreign countries, and children's stories. Each number contains 10 different slides. Choose from these:

GROUP E

1. Shrines, Wash., DC
3. Rodeo in Calif.
4. Block Island
7. From the Empire State Bldg.
9. Times Square to Central Park
13. Bryce Canyon
14., 14A., 14C. Yellowstone
15. Washington, D. C.
18. Big Bend Nat'l Pk.
21. Hialeah Racetrack, Florida
25A. California
27A. N. Y. Midtown
28. NYC Financ'l Dist.
31. Chicago, Illinois
40. Atlantic City, N. J.
44A. Mackinac Isle Mich.
60. Madrid, Spain
70., 71., 72. Ireland
81., 82., 83. Rome, Italy
101. Cairo, Egypt
110., 111. Bombay, India
120., 121. Lisbon, Portugal
130. Alaska
145. Austria
151. Istanbul, Turkey
160. Athens, Greece
191. Havana, Cuba
202. Canada
208. Australia
211. Haifa, Tel Aviv, Israel
C-4 Story of Pinocchio
C-5 Tarzan
C-10 Fun at the Fair
C-11 Snow White
C-12 3 Caballeros

GROUP F

2. N. Y's Hudson River
30. Great Smokey Mts.
32. Notre Dame Univ.
34. Colorado & Estes N'tl Park
35. Kansas City, Mo.
39. Wisconsin Dells
40A. Atlantic City
80. Rome, Italy Landmarks
85. Vatican City, Religious Shrines
87. Inside Vatican City
88. Genoa & Columbus
180. Mexico, Tourist Paradise
181. Touring Mexico
206. Newfoundland

GROUP E — Any set of 10 slides, 50c, if purchased with 4 or more Group E sets.

All slides have subject matter imprinted.
Any two sample sets (20 slides) $1.35 ppd.
Shipping Chgs: 1-4 10c, 5-14 30c

Our stocks of Group E slides are rapidly dwindling—so be sure to state a few alternates with your order.

GROUP E — Any 4 sets (40 slides) $2.40—Any 8 sets (80 slides) $4.80

NEW WINTER 1955-56 CATALOG '25'. Order yours today. Only 5c per copy—10c back on first purchase! Contains a wealth of interesting accessories at fabulously low prices!

for the twin lens reflex camera fan

FIELD LENS $2.00

A SENSATIONAL SPIRATONE EXCLUSIVE WORTH 2½ TIMES AS MUCH

A flat thin Fresnel ring plate which fits over groundglass in your reflex camera, greatly increasing brilliance of viewing image, making the often almost invisibly dark corner image ten times brighter! No installation—just drop fieldlens onto groundglass. Postpaid.
For Rollei, Graflex "22", Ciroflex, Ricohflex, Argoflex, etc.

MAGNIFYING HOOD $2.95 PPD

FOR ALL TWIN LENS REFLEX CAMERAS

Twin magnifier makes possible accurate focusing and composing of entire groundglass image with BOTH EYES and at comfortable distance, while protecting groundglass from glare. Saves eyestrain, helps accuracy, dim light focusing. Instantly removable and collapsible. For Rolleris, Graflex 22, Ricoflex.
COMBINATION OFFER: Magnifying Hood plus Fieldlens $4.50

AUX. TELEPHOTO and WIDEANGLE LENSES

for Rollei (except 2.8), Ciroflex, Graflex 22 $16.95 EA. or $29.95 for set, in double leather case.

35MM ADAPTER FOR ALL TWINLENS REFLEX CAMERAS

Without installation, the Minidapter enables you to use 35mm film in your 120 Rolleiflex, Rolleicord, Ciroflex, Grafles 22, Flektar, etc. —yet, you can change back to your regular size any time you wish. Minidapter comes complete with groundglass mask and separate finder, for vertical and horizontal shots, ready to use ..... $9.95 PPD.
Ricohkin 35mm Adapter for Ricohflex $8.95

2¼ SQ. GLASS BINDERS AS LOW AS 5¢ Ea.

At last—an economical type-on mount with 2¼ x 2¼ outside dimensions to fit standard viewers, projectors. Each binder comes complete with two glasses. *Shpg. Wt. 4, 7 and 18 lbs.*
50 for $3.65 — 100 for $6.40 — 400 for $20.00
Sample Package of 12 — $1.15 postpaid

EYELEVEL FINDER for ROLLEI, CIROFLEX, GRAFLEX 22, RICOHFLEX

$7.95 At last — an expensively finished optical device which shows a right side up image for easy eyelevel focusing!

Clips instantly on and off Rollei hood! Highly corrected optics, all metal construction. Name camera when ordering.

PARALLAX CORRECTING CLOSEUP SETS FOR ROLLEI, CIROFLEX, GRAFLEX 22, RICOHFLEX

Perfect closeups every time—sets fit cameras without any adapters, are guaranteed to equal $20.00 sets in performance. #1 set focuses from 38" to 20", #2 set from 20" to 13"
Shipping Charge 10c

	Each set	Both for
ROLLEI (3.5) BAYONET MODEL	$5.95	$10.95
CIROFLEX, GRAFLEX 22 MODEL	4.95	8.95
RICOHFLEX MODEL	3.95	6.95

7 SECTION POCKET TRIPOD $6.19

- Folds down to 9" and right into your pocket!
- 7 sec. extend to 4 ft.
- Sturdily supports 35mm and light 2¼ x 3¼ cameras
- Rubber tips, leg stops.

Wt. 13 ozs. Sh. Chgs. 35c. With Accura tiltop, $8.95

SAVE 50% AND MORE ON POLASCREENS

w/o Polo Screen — w/Polo Screen

The most useful lens accessory made, equally suited for ALL color and b&w films.
Eliminates reflections in scenery, water, show-windows, increases contrast between cloud and sky, the ONLY sky filter usable with Kodachrome, Anscocolor, Extachrome, Polascreens have double threaded rings to allow use of extra filter or closeup lens, handle for convenient adjustment of maximum polarizing effect. *Sh. Ch. 10c.*

Ser. IV 3.75 Ser. VI 4.75
Ser. V 3.75 Ser. VII 5.75

INSERT RING, holds extra filter with Polascreen, Ser. V or VI 30c
Polarizing Filters to fit Standard Filterholders
Unmounted: Ser. V $1.40, Ser. VI $1.50
Mounted: Ser. IV $1.75, Ser. V $2.40, Ser. VI $2.90, Ser. VII $3.80

SALE IN OPTICAL GLASS FILTERS

Filters are the tools of the photographer—yet, fine filters, made by the best known manufacturers in the country, need not be costly. Each filter is ring-mounted, and engraved as to type.

Ser. IV $1.15
V 1.39
VI 1.50
VII 2.00

FREE on request: Famous Moto Fitter Compact meet Case with purchase of 4 or more Ser. V, or Leather Filterbank with 6 or more Ser. VI filters (incl. polarizing) and closeup lenses. Cases cost regularly $3.50 (Ser. VI), $1.25 (Ser. V).

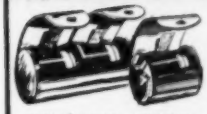
"About Filters, Closeup and Minus Lenses" is a booklet crammed with valuable info. Send 25c, or free on request with orders of $3.00 or more

FOR B&W: Lt. and med yellow, green, orange, haze, red and infra-red
FOR ANSCOCHROME, ANSCOCHROME: 10, 11, 12, UV 15, 16, 17
GENERAL: Neutral Density 2X & 4X
FOR KODACHROME, EXTACHROME: Haze, Skylight, 2A, 2B, 85B, Type A, Blue 80, 82A, 10, 20, 81, 81A, B, C, D, EF.
CLOSEUP: +1, +2, +3.
FOR THE NEW EKTACHROME: 85C, 82A, 82B, 82C.
LENS SHADES: Ser V $1.25, Ser VI $1.50, Ser. VII $3.00

Shipping Charges 1 to 5 filters 10c, 6 or more 30c.

Looking for a Strobe? Confused by exaggerated claims, technical terms? Write for free pamphlet 'S'—you'll know then what to look for!

Spiratone AUX. TELEPHOTO and WIDEANGLE LENSES



FOR COLOR — FOR BLACK AND WHITE

By far the most popular accessory for the 35mm camera owner! Spiratone lenses add to the camera the advantages of telephoto effects for improved perspective in portraits, for moderate distance shots so that the important subject matter will fill the entire negative or slide, and of wideangle effects, for landscapes, and indoors, where space is limited, of greater depth of field.

SPIRATONE LENSES OFFER THESE EXTRAS:

- **Built-in or Separate Filterholder furnished for each (set of) lens(es)**
- **Interchangeability of standard adapters, so that one lens may often be used with several cameras (each lens is supplied with only one adapter—extra adapters are $1.25 each, when suited).**
- **Extra hard S-coating.**
- **Excellent color-correction.**
- **Lifetime Service Guarantee.**
- **No change in exposure or lens opening needed.**
- **Comprehensive instructions for simple use—lenses fit your camera like filterholders, require no installation.**
- **Availability of filters — your free choice of any TWO with every aux. lens you buy, selected from these: yellow, orange, green, haze, red, blue. Others $1.00 each.**
- **Availability of MATCHED telephoto and wideangle finders, and a special Universal Finder.**
- **Finders fit accessory clip, can also be used handheld.**

UNIVERSAL AND CLOSEUP (+1, +2, +3) FINDER, the most versatile finder ever made, matched to your **normal** 50mm or 44mm lens, telephoto and wideangle Aux. Lenses. Has parallax correction to 10', for use with +1, +2, +3 closeup Lenses, and from three feet to infinity. **$9.95**

Each lens in leather case (incl. 2 filters) **$16.95**
Shpg. Chg. 85c

Set of both lenses, in double leather case (including 4 filters) **$29.95**
Shipping Charge 60c

Each Finder, telephoto or wide-angle **$3.95**
both for $7.49

Universal 44mm finder, for Contessa, Bolsey, Signet etc. reg. 8.50 **$4.98**

Accessory Clip for Argus C3, easily installed $1.00

Accessory clip, easily glued to most cameras 75c

GREAT NEWS

Spiratone aux. telephoto and wideangle lenses, greatly improved, are now available at the same low prices for 2¼ x 2¼ Twinlens Reflex Cameras—Rolleicord and Rolleiflex bayonet mount (f:3.5 only), Ciroflex, Graflex 22, Ricohflex, Kodak Reflex. For twinlens users seeking a moderate increase or decrease in focus length, Spiratone aux. lenses add greatly to the versatility of their camera.

SPIRATONE AUXILIARY LENSES ARE AVAILABLE FOR THESE 35MM CAMERAS AND MANY OTHERS

ARGUS C3, C4 · BANTAM · BOLSEY · CONTAFLEX · CONTESSA · EDIMEX · EXIFA · KODAK 35 · MERCURY · RETINA · SIGNET · VITO

MINUS LENSES for TELEPHOTO EFFECTS

If you have a camera using, or capable of using a bellows or extension tube set, you will want to invest in Minus Lenses for the thrill of taking telephoto shots without buying a regular telephoto lens, or extreme telephoto shots, in conjunction with your telephoto lens, for example, a single Minus 4 lens makes your 135mm telephoto into a 270mm telephoto—varied combinations will produce a variety of effects. Minus Lenses improve the perspective in portraits, too, by lengthening the effective focus length. **Thousands of Exakta, Praktica, Contax S and Leica, Canon owners with reflex housings find Minus Lenses most useful accessories.**

	PER 3	PER 4
Minus Lenses are mounted in Metal Rings and are sold in sets of three (of your selection) or four. Available in Minus 1, 2, 3, and 4. *Shipping Charge 10c.*		
SER. V	$3.60	$4.70
SER. VI	$4.35	$5.65
SER. VII	$6.00	$7.80

ACCURA REFLEX HOUSING for LEICA, CANON $39.95

Shpg. Chg. $1.00 **READY TO USE—WITH DUAL RELEASE SYSTEM**

Never before could so small an investment change your Leica, Canon into a single lens reflex camera, ideal for parallax-free closeup, telephoto, medical and scientific work! Focus with formerly impossible fraction-of-inch accuracy through adjustable magnifier on bright, curved groundglass, press release: mirror jumps up, exposure is made of exact image you saw! Use with extension tubes or bellows for closeups, with special 135mm tele lens for complete closeup to infinity range.

SAVE MORE STILL BY BUYING COMBINATIONS

REFLEX HOUSING + Folding Bellowscope	$49.95
REFLEX HOUSING + Special ctd. 135mm f:3.8 SUN tele	69.95
REFLEX HOUSING + Folding Bellowscope and special ctd. 135mm f:4.5 telephoto	73.95

FREE with any combination offer above: New Eyelevel Mirror device, a $14.00 value.

SYNCH YOUR OLD LEICA, CANON FOR FLASH OR STROBE $3.49 PPD

No installation—just one quick adjustment over release button and you are all set for flash shots at speeds to 1/30th. Tripper accepts standard flashcord—or buy from us with flashgun to fit accessory clip.

Famous GOSS KONTAKT, synchronizes Leica IIIA, IIIC, cameras even at high speeds, was $19.95 **$8.00** *Shipping Chge. 35c*
Imported Economy Gun w. tripper $6.49; w. Geiss $9.75
Foo-type BC Pocket Flash w. tripper $9.95; w. Geiss $13.25

CLOSEUPS ARE SIMPLE

and inexpensive, when you buy your closeup accessories from Spiratone, the only firm specialized in low-cost closeup photography equipment.

GOOSENECK LIGHT ATTACHMENT $5.95

With C clamps, fits copy stand or enlarger pole. 2" bullet reflectors, $1.00 add. *Sh. Wt. 6 lbs.*

FREE with orders over $3.00, or send 25c for CLOSE-UP DICTIONARY . . . Contains all needed tables, too.

DELUXE COPYING STAND

Designed by us for use in conjunction with closeup lenses, extension tubes, bellows attachments, to complete with a moderate investment, your closeup and copying equipment. Strong enough for a 4x5", yet compact in storage (two-piece post) and equally well suited for copying, medical, scientific work and movie titling. Camera bracket permits centering of camera over subject. 15x18" baseboard is very practical for large originals. 1½" diameter pole is 38" high. *Shipping Weight 11 lbs.* **$9.95**

EXTREME CLOSEUP LENSES

can be used with any camera—with the greatest of ease and with no extra accessories. You can get as close as 8" with a Plus 4, 7" with a Plus 5, 5½" with a Plus 6, 3½" with a Plus 10. You can use two extreme closeup lenses, with a double retaining ring, for even more extreme closeups. With a Plus 5 lens, you can fill the complete 35mm frame when reproducing a postcard; a Plus 10 lens is just right for insects, stamps and coins. Extreme Closeup lenses make macrophotography possible with a tiny investment. **All exc. Plus 10, mounted in metal rings.**

	Ser. V	Ser. VI	Ser. VII
Plus 4	1.75	2.00	3.25
Plus 5	1.95	2.30	3.75
Plus 6	2.25	2.75	4.25
Plus 10	2.65	3.25	5.25
Obl. Ret. Ring	.85	.95	1.50

CLOSEUP (Portrait) LENSES

bring within every photographer's reach subjects which would be too small if photographed at the regular 3 ft. closest camera setting. Head and shoulder portraits, children's pictures, copy work—a whole new field of picture taking. All Closeup Lenses are mounted in metal rings. Deluxe lenses, made by nationally famous manufacturer, have diopter power engraved on rings.

	Reg.	Deluxe
Ser. IV		1.15
Ser. V	1.00	1.30
Ser. VI	1.25	1.50
Ser. VII	2.00	2.50

Plus 1 focuses from 38" to 20", Plus 2 from 20" to 13", Plus 3 from 13" to 10"—for versatility, you will want set of all three Closeup Lenses. *Shpg. Chge. 1-4—10c.*

6-PC. EXTENSION TUBE SET

for Kine Exakta, Exa. This set contains two precision-fitted brass adapters and four tubes, 5mm, 15mm, 30mm and 45mm, providing the greatest possible range of closeup work from a 3.4 reduction to a 2.2 magnification ratio. *Shipping Charge 35c.* **Same set but with one FOCUSING TUBE from 45mm to 55mm, alone a $10 value. Complete set** **$11.50**
Economy 5-pc. set, 3 tubes, 2 adapters $4.99.

4-PC. EXTENSION TUBE SET

for Praktica, Praktiflex FX, Contax, S, D, DA, Pentacon **$6.95**

This exceptionally well-made set includes in addition to the usual 5mm, 15mm and 30mm tubes a 45mm tube, thus permitting up to 2X magnification, when the complete set is used: a tiny object, ⅓" x ¾" can be made to fill the entire 35mm negative or transparency! *Shipping Charge 35c.*
Same set, but with one FOCUSING TUBE, alone a $10.00 value, increasing maximum extension to 100mm. **$9.95**
Economy 3-pc. set $3.98

LEICA, CANON 4 PC. EXT. TUBE SET, INCL. ONE FOCUSING TUBE, $10. VALUE **$10.75**

GROUNDGLASS FOCUSER for CONTAX II, IIA, III, IIIA $4.95

Fits directly inside film opening, makes possible foolproof composing, focusing.

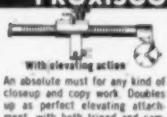
COMB. OFFER: Ground Glass Focuser + 4 pc. Metal Extension tube set, a $20. value **$10.95**
Focuser & Folding Bellowscope **$17.95**

Focusing GROUNDGLASS for LEICA, CANON

$4.95 Permits checking of lenses, composing, focusing for closeups.

COMB. OFFER: Focusing Groundglass + Focusing Extension Tube for Leica, a $15. value **$10.50**
Ground Glass & Folding Bellowscope **$17.50**

PROXISCOPE SR. $4.95



With elevating action

An absolute must for any kind of closeup and copy work. Doubles up as perfect elevating attachment, with both tripod and camera fittings for horizontal as well as vertical fastening of camera. *Shpg. Chg. 35c*

- **A deluxe version of the most useful camera accessory for every practical photographer.**
- **Permits minute adjustments in a 4½" range on its geared track, with a positive lock at any desired point.**

FOLDING BELLOWSCOPE

$14.95 ppd. **Available for Leica, Canon, Kine Exakta, Exa, Praktica, Praktiflex FX, Contax S, D, DA, Pentacon.**

New size for Nikon, Contax I I(a), I I I(a).

The most useful of lens-to-camera closeup accessories. It weighs only 5 oz., has fine leather bellows and a geared track with a positive lock. A sturdy accurate frame assures proper alignment. An extension range up to 5" is provided, with exposure factors engraved on the track. *Shpg. Chge. 45c.*

FREE with FOLDING BELLOWSCOPE: PROXISCOPE JR. a $4.00 value.

While They Last — Brand New!

135MM f: 3.8 TELE for LEICA, CANON $39.95

Guaranteed the sharpest lens you can buy—regardless of price! Rangefinder-coupled, elegant lightweight mount, depth of field scale—at an unbelievable saving!
Shipping Charge 75c
Deluxe Leather Case $3.00 Matching 135mm Finder $8.00

USEFUL ACCESSORIES

FAMOUS MAKE PHOTO ELECTRIC EXP. METER

- **Sensational import from Germany!**
- **Sturdily constructed, with super sensitive electric eye for maximum range!**
- **Settings from 1/1000 to 60 sec, f:1 to f:22, ASA 4 to 250.**

A $15.00 VALUE $5.59 WITH ER CASE

Most compact—2" x 3" x 1" and light: 4 oz. Snap open protective cell cover, set desired shutter speed opposite pointer—and you are ready to read off correct opening for your film. One hand operation. One year guarantee by Spiratone and manufacturer. *Shp. Cost 10c*

METAL SNAKE CHAIN $1.29

FOR EXAKTA, LEICA, RETINA, PONY AND OTHERS

Smoothly suspends camera at chest height for worry-free carrying without case! Elegant, practical, safe and luxurious—at half the usual cost. *Shipping Charge 10c.*

KING SOL SOLENOID $5.59 ppd

Assures perfect synch at all speeds with Graphic, Busch, Ciroflex Rapax, Rollei—the professional way. Instructions for press camera installation supplied—others have mechanic install. **Was $15.00!**

TIME EXPOSURE & DELAYED ACTION NOW ADDED TO EVERY CAMERA

AUTOKNIPS II WAS $4.95 $2.95

This most popular of all self timers in conjunction with a cable release, adds to your camera a feature many a photographer has paid a small fortune for. 11 slow speeds from ½ a second to ten seconds! *Ship. Cost 10c*

CABLE RELEASES: 4" 25c 7" 35c 10" 45c 40" $1.25

SYNCH YOUR OLD CAMERA

- **Fully adjustable mechanical tripper, requires no installation, works through standard cable release socket of most old cameras. Has fitting for standard flash cord.**
- **Allows adjustment for flash bulbs and zero (X) delay for Strobe.**

$2.49 PPD

Tripper with famous make all metal flashgun (Flashgun only is $6.95 value, has bracket, accepts screw base bulbs, bayonet base adapter 39c) *Shipping Weight 2 lbs.* **$4.95**

KOILED FLASH CORD $1.98

- **Now available for most shutters.** *Sh. Chg. 10c*
- **Patented coiled cord extends to 3 ft., yet coils up without effort to only 7".**

So handy when you want to hold flash away from camera, place electronic flash closer to subject than camera! Available with standard polarized household type plug for Heiland, etc., and prong type for Kaiser to fit Compur, Prontor S, ASA (Kodak) Solenoid, Argus C3, C4, Nikon, Realist, Praktiflex, Bolsey and Exakta synchronized terminals.

10 FT. CABLE RELEASE $4.49

with setscrew and booster spring

A sturdily constructed German cable for remote control work to operate with any Kodak or Compur type shutter. Imagine the many **new** possibilities this release opens up for you—whether you photograph wild animals, unsuspecting children at play or take a self-portrait, you'll find this release a valuable accessory. **(Leica model add 25c.)** *Shipping Cost 85c.*

Other long Cable Releases with setscrew.
40" $1.50 60" $2.50 20 ft. $7.95 40 ft. $12.49

Exclusive Spiratone Values!

LEATHER GADGET BAGS

Made by the foremost manufacturers in the field, and exclusively offered by us, through a special purchase, below or close to the usual wholesale prices. These bags are all brand new first class merchandise not to be confused with "seconds" or "closeouts" of inferior leather bags. *Shpg. Wt. of Gadget Bags: 3, 4, 6, 6 and 6 lbs.*

The SP1 and SP2 bring within the reach of every photographer ample size leather gadget bags, with large outside pocket, adjustable shoulder strap, rich saddlestan shade, solid brass hardware, and an adjustable inside partition.

SP1 measures 7x9½x4½ and is priced at half of list **$4.89**

SP2 measures 8½x10½x4" and stands comparison with $15.00 to $20.00 bags **$6.89**

SP5. A topgrain pigskin bag for the advanced amateur or professional, large enough for press cameras (10" x 12" x 5"), or for taking "both cameras" along. "Wraparound" zipper, flashgun holder, shoulder pad. If you couldn't afford that $30.00 bag, you won't pass up the SP5 at a 54% saving. **$13.95**

SP6. An over-sized genuine cowhide pressbag. 10½" x 14" x 5", largest size available in gadget bags costing normally $40.00 to $50.00. Adjustable strap runs around bottom of bag—no equipment too heavy for this bag! Inside cover is a batterycase holder, on sides are one large pocket for meter, two small ones for filters. Adjustable inside partition. Back and bottom are fibreboard lined for extra support. We'd bet you'd only expect to pay that little only for a plastic bag, for the cowhide SP6 is only **$16.95**

SP6X-PANDO, the Spiratone miracle bag that **GROWS,** always making room for new equipment. Same size as the SP6 when X-PANDO zipper is closed, you can add a full 4" to the bottom width, an 80% increase is needed! **$19.95**

TURN PAGE FOR MORE SPIRATONE VALUES

FOR THE 8MM & 16MM MOVIE FAN

8PC. DELUXE MANSFIELD ACTION EDITOR

SAVE 50%

8MM MODEL Reg. $60.50 **$29.75**

FREE with Deluxe Action Editor: Elegant Beaulchest, for 12 reels (specify 200, 300, or 400 ft. cap.) *Shpg. Wt. 12 lbs.*

16MM MODELS, same as 8mm but with 2,000 ft. rewinds, reg. $60.50 **$34.75**

Diecast base comes readily apart for compact storage. Action Viewer has focusing AND framing control, projects brilliant image on 2x3" screen. Easy to thread, scratchproof, scientific ventilation of lamphousing. Complete Outfit: Viewer, 3 piece base, automatic master splicer, cement, pair of 1200 ft. rewinds.

4 pc FAMOUS MAKE 8mm EDITING OUTFIT $10.95

A value like never before! SAVE $10.55

Outfit contains Projection Editing Viewer, with bulb, pair of rewinds with brakes, all metal splicer, all ready for simple mounting on board or table (not supplied). Can you afford to pass up such a value? *Sh. Wt. 6 lbs.*

CINE TITLER

REG. $5.95 — For 8mm & 16mm — **$3.69**

SAVE 40%

Titles add action, provide continuity for your movies! Yet making titles is so simple with the Cine-Titler! Sturdy metal construction. Auxiliary lens for exact focus. Photograph picture postcards, titles of your own design: you can even shoot animated titles—an instruction booklet accompanies every titler. *Shipping Weight 6 lbs.*

If purchased at the same time as Action Viewer, Action or Super-Deluxe Editor

Titler alone $4.64

SUPER DELUXE 8mm EDITOR

$14.95 Same viewer, rewinds as above, but with automatic splicer, plus metal base—a $26.00 5 pc. set *Sh. Wt. 6 lbs.*

SALE IN METAL REELS and CANS

8mm	200 ft. sets 6 for 3.39	
	400 ft. sets 5 for 3.98	
	800 ft. sets 5 for 2.98	

Ship. Wt. per set 5 lbs.

8mm ACTION VIEWER

$16.88 • Projects brilliant 2" x 3" pictures in full action on the built-in groundglass screen—not just one frame at a time, but in continuous motion. A viewer which makes editing a real pleasure. Operator can adjust focus to his own vision. Easy to thread, scratch-proof, scientific ventilation of lamphousing—really a blessing for movies (sets with a limited budget who know they'd have to spend $40.00 and up for a viewer like it! *Sh. Wt. 4 lbs.*

16mm Mod. **$17.95**

8mm PROJECTION EDITING VIEWER

You'll more than ever enjoy editing your movies when you use this neat, all-metal, electric editing viewer. It projects a clear image on the ground glass, makes possible viewing from a comfortable distance. *Shipping Weight 8 lbs.* **$6.95**

8MM POCKET TITLER and CLOSEUP DEVICE

$6.95 PPD.

Makes any title on the spot, catches those otherwise impossible closeups of flowers, insects without any need to measure or focus, reproduces 35mm Kodachromes on 8mm film! Completely collapsible, with precision ground lens, the Pocket Titler screws directly into 8mm Brownie, B&H 220, 252 cameras, or into Tiffen "C" adapter ($1.15 extra for any camera).

FREE WITH POCKET TITLER: 20 Titling Cards, 10 color slides!

Name make, model, speed lens when ordering.

Save 50% on Famous Make 15MM WIDEANGLE for 16mm **$19.95**

For the first time, a brand new, 1955 model coated, color corrected, fast 15mm f:2.2 wideangle lens in standard C mount, to fit all 16mm Revere, Keystone, Bolex, B&H cameras—at half the price you'd normally pay for such a fine lens! Twice as fast as an f:2.7 lens—built-in filter-holder—focuses from 8' to infinity—yours brand new for only $19.95

COMBINATION OFFER: 15mm f:2.2 WA plus 3" f:2.5 TELE—both for only **$44.95**

1/2" f1.9 NORMAL FOC. MOUNT 8mm LENS

$12.95 PLUS YOUR LENS

Whether you own a Keystone, Revere, Cinemaster, Delur, B&H Sportster or Companion 8mm camera, you can now trade your normal (12½ or 13 mm) size f:2.5, 2.8, 3.5 lens for a brand new coated ½" f:1.9 lens with clickstops in one foot to infinity focusing mount! You can still set this lens at 10 feet and use its depth of field like a 'fixed focus', but closeups can be accurately focused and distant shots will be sharper, too. When you bought your new camera, you would have had to pay $25.00 or more extra for such a lens! ½ f:1.9 lens without trade-in $19.95. Screw-in filterholder

Aux. Wideangle Lens, screws into ½" f:9, makes a f:9 Wideangle when needed, only **$4.95**

1" F:1.5 NORMAL FOC. MOUNT 16MM LENS **$29.95** Fits all C Mount cameras, accepts 21.5mm filter, coated—colorcorrected. Reg. $54.95.

PORTABLE CRYSTAL-BEADED 30x40 TRIPOD SCREEN

LOWEST PRICES EVER **$7.69**

- Crystal-beaded Pyroxilyn surface.
- Screen raises and lowers on elevating rod, assuring positive alignment.
- Carrying handle sets automatically for balanced carrying.

Despite higher steel prices, Spiratone continues to offer you the biggest bargains in screens ever! Same quality as before, and as praised by thousands of movie and slidefans. Metal can has beautiful scratch-resistant finish. Sturdy tripod is plated and has protective rubber tips. Thousands of these screens are in use, not only by amateurs, but by clubs, churches, colleges as well.

Screen Size		Ap. Sh. Wt.
30" x40"	7.89	10 lbs.
40" x40"	9.19	11 lbs.
37" x50"	10.84*	14 lbs.
50" x50"	12.87*	15 lbs.
52" x70"	24.95*	

*Screens are shipped by us Express (freight costs collect) within U.S. — other screens P.P. or Express.

40 x 40 SILVER TRIPOD-SCREEN **$12.95**

Now everyone can afford 16mm movies! BRAND NEW 16MM CAMERA $29.95

Never before such a buy. Drop-in spool loading 100 ft. capacity—15 ft. run with single winding—Standard C-mount for complete lens interchangeability—Fingertip Control.

AVAILABLE COATED, COLOR-CORRECTED LENSES: Normal: 1" f:2.5, $8.95; 1" f:1.9 in foc. mt. $19.95; 1" f:1.5 in foc. mt. $29.95; 3" f:3.5 telephoto in foc. mt. $19.95; 15mm f:2.2 wideangle in foc. mt. $19.95

Cowhide Carrying Case $6.95 — 25 ft. Remote Control Cable $6.95

Shipping Charge $1.00

The lenses you have read about, the lenses photo editors have raved about now at ultra-large savings up to 50% Ultraspeed Movie Lenses

for 'available light' movies

Superb coated, color corrected lenses, in focusing mounts, with clickstops—all of them faster than were ever thought possible only a few years back! 8mm lenses in D or B&H mounts, 16mm lenses in C mounts, to fit virtually all Revere, Keystone, Bell & Howell, Bolex, Delur Cameras (exceptions: very small turrets). Made by famous manufacturers, these lenses combine speed, exceptional definition and fine appearance with prices lower than those you'd expect to pay for old-fashioned slow lenses—so why not get the fastest and finest?

For 8mm: All 3X telephoto lenses.

1½" f:1.8 ..... $17.95 — 1½" f:1.5 ..... $23.95

1½" f:1.1 (also av. for Kodak Mag.) $25.95

1½" f:1.1 World's Fastest 7 elements—wt. 6 oz. $89.95

Generous Trade in allowance for your old, slow lens.

For 16mm:

3" f:1.8 3X telephoto $27.95 3" f:1.5 3X telephoto $59.95

1" f:1.5 normal lens $34.95 15mm f:1.5 83° wide $59.95

Trading accepted towards f:1.5 lenses.

Warranty: All Ultraspeed lenses are guaranteed by us to be equal or better than any other lenses of equal speed, regardless of price.

Shipping Charge 75c per lens

Coated, Color-corrected—DOUBLE PURPOSE W-I-D-E ANGLE 8MM BROWNIE

CAMERA and PROJECTOR $11.95

Screws into 8mm Brownie Movie Camera and more than doubles angle of lens, making those group shots indoors, those difficult landscapes, child's play! Snap lens over projector—and you double screen image even in small room!

TELEPHOTO for Brownie cuts distance into half, brings up close those far-away scenes! A "must" for outdoor movies

Telephoto-Wideangle Finder for Brownie ..... $1.50 — **$9.95**

COMBINATION OFFER: Brownie Camera and Projector Wideangle, Telephoto, Finder—all three for only **$21.95**

Shipping Charge, per lens, 10c—State if you have f:2.7 or f:1.9 lens.

7MM f:2.5 WIDEANGLE LENS for 8MM

$17.95 At last—a fine 8mm wideangle lens priced within every movie fan's reach! Covers four times the area of your normal lens, makes movie-taking indoors, of large groups, in limited space or wherever greater coverage and an enormous depth of field are desirable, simple and effective. Chrome finish, click stops, D or B&H mount.

8MM f:1.9, an extremely fast extreme six-element wideangle lens with clickstops, focusing mount 6" (!) to infinity, for the demanding movie fan. Brand new, ctd, color-corrected at the low, low price of **$29.95**

25 FOOT DOUBLE 8MM COLORFILM $2.49

• PRIVATE BRAND • 100% FRESH • RELIABLE

Available in Daylight (ASA 10) and Tungsten (ASA 16) types. Excellent processing service included. Standard Kodachrome conversion filters may be used! 3 for $6.89. *Shpg. Chgs. one 8c, three 30c.*

INCIDENT AND REFLECTED LIGHT PHOTOELECTRIC EXP. METER

$6.95 From Japan comes a most compact (1¾" x 1" x 2¾"), yet extremely sensitive photoelectric exposure meter which competes in accuracy with the finest and most expensive meters. Calibrated in ASA speeds (from 6 to 800), for lens openings from f:1 to f:32, the meter measures reflected and incident light, has settings for stills and for movies, for conventional as well as light value Compur shutters. One hand operation. Richly illustrated 16 page instruction booklet. Everready Top-grain Leather Case and Metal Carrying Chain $1.50 *Shipping Charge 35c.*

FREE 64 page dictionary on "Photography", valuable to beginners and advanced camera fans.

PENTAPRISM FINDER FOR EXAKTA V, VX, EXA

SAVE 65% **with RANGEFINDER PRISM**

Latest German import! Replaces the waist level finder, shows unreversed, right side up, brilliant image!

Split image prism rangefinder instantly shows correct focus. Roof Prism Finder without rf $21.95. Rangefinder Prism with groundglass, for your Pentaprism Finder $9.95 (no installation needed). Leather case $1.00. *Shipping Cost 50c*

$29.95 BRAND NEW AND COMPLETE

SENSATIONAL OFFER: Scientific groundglass with cross hairs, for critical closeup focusing, fits any pentaprism finder, a $16.00 value for only **$4.95**

$2.49 if bought together with Pentaprism Finder

SAVE 50% BODY, REAR & LENSCAPS SCREW IN BAYONET

- For Leica, Canon, Kine Exakta, Praktica, Contax S, D, DA, Exa.
- All caps precision machined aluminum.

$1.00 ea. 3 (asstd.) $2.80

BODY CAPS protect camera body, shutter, when lens is removed. REAR LENS CAPS are a must for all your extra lenses. And FRONT LENS CAPS make perfect seal against any harm to optics, cannot fall off. Available for Sonnar, Biotar, Primoplan, Westar, Tessar, Triotar—be specific when ordering. *Prices on other Front Caps on request.*

Famous Make German 35mm f:2.5 Wideangle $64.95

for Kine Exakta, Exa, Praktica, Contax S, B etc.

Six elements—preset diaphragm—coated—superbly color-corrected—distortion-free corner to corner sharpness—64° coverage (normal 58mm lens covers 39°)—focuses from 1½ ft.!

Deluxe Leather Case $2.00 *Shipping Charge 75c*

Save over 50% on brand new, world famous Sun 135mm f:3.8 Tele for Exakta

Never before in history could you get for so little, a fast, ultrasharp 135mm lens in an elegant satin-chrome, leather-trimmed mount, with depth of fieldscale engraved. Optics are removable, too, for complete range bellows use! **$28.50**

Deluxe Leather Case $3.00 *Shipping Charge $1.00*

COMBINATION OFFERS for KINE EXAKTA

135mm f:3.8 Sun plus Folding Bellowscope, plus Bellows adapter, an $84.00 complete range outfit—yours, brand new, for **$43.95**

135mm f:3.8 Sun plus 35mm f:2.5 Wideangle, a $160.00 value—both lenses, the ideal outfit, yours for only **$89.95**

Modernize your Press-Camera! 135mm f:3.5 in COMPUR for 4x5" $26.95

For double, you could get no finer lens, no finer shutter: 8 speeds from 1 second to 1/260th. X-synch for flash and strobe, cable release socket, delayed action—but the quantity is limited indeed, so hurry!

Same lens, in Press-Compur, without delayed action, but with blade arrester for easy focusing **$29.95**

Lensboard for Graphic, state model, $2.00 *Sh. Ch. 75.*

65mm WIDEANGLE for 2¼ x 3¼ $19.89

- 9 speed Compur Rapid shutter, to 1/500, with X synch for flash and strobe.

Another Leitmeyr-made wideangle lens, 65mm f:6.8, covers about 85 degrees on the 2¼x3¼ negative. Its symmetrical construction permits use of either half of the lens as a 130mm telephoto. Lensboard for Graphic (state model) $2. *Shipping Charge 25c*

FAN-TYPE BC POCKET FLASH

- At last, a completely collapsible flash at a down-to-earth price!
- Sturdy battery case has built-in test lamp, ejector, accepts standard bayonet bulbs.
- 6" diameter metal reflector has special pebble finish for maximum reflecting power, instantly telescopes making entire unit a bare 4" x 2"

$4.99

Clip-on Diffuser reg. $1.29—if bought with Pocket Flash, only 49c

Standard shoe, fits on accessory clips. BRACKET, for use on any camera, $1.00. Cord available for all Compur and Kodak synch. terminals. For Kine Exakta, Praktiflex TX, Leica M3, Realist, Argus C3, C4, add $1.00. BC battery, lasts for a year, $1.00. *Sh Ch 35c*

120 gS flashbulbs $10.00 ppd. 120 gS Focal Plane flashbulbs $12.00 ppd.

2 x 2 GLASS SLIDEBINDERS

- Comparable to 8c slidebinders.
- One of the finest methods of mounting transparencies (35mm Argus, Leica size) betw. glass!

2½¢ ea. in lots of 200

The biggest bargain in quality slidebinders ever offered. Pregummed Fibreboard, self-centering of slide, provision for type-on titles, dustproof, lintfree, shockproof—all these advantages are yours for less than the usual cost of glass alone! Why risk fingerprints and scratches on your irreplaceable color shots? 200 for $5.00. *Shipping Weight 5 lbs.*

Sample package of 20 2x2 glass and 3 2x2 metal binders, postpaid **$1.25**

200 singleframe (Mercury) Masks $1.75 (Masks fit glass

200 Square (Robot, Tenax) Masks $1.75 (& metal binders

2x2" cardboard mounts for single frame (Mercury size) transparencies 80 for 55c. *Sh. Wt. per 100, 1 lb.*

800 for $18.95

LAST MINUTE RUSH SERVICE

Please order early this Christmas—but if you did wait too long, don't hesitate ordering, late orders are shipped practically the minute they are received and by the fastest means!

All prices include excise tax. Postage and insurance MUST be prepaid, even when no shipping weight is stated — overpayment will be credited in full. Everything listed is brand-new (unless otherwise stated) and fully guaranteed against defects. 25% deposit on C.O.D.'s. Items marked 'Free', 'Premium' or 'Bonus' MUST be requested at time of purchase. Foreign orders welcome — slight extra handling charges apply.

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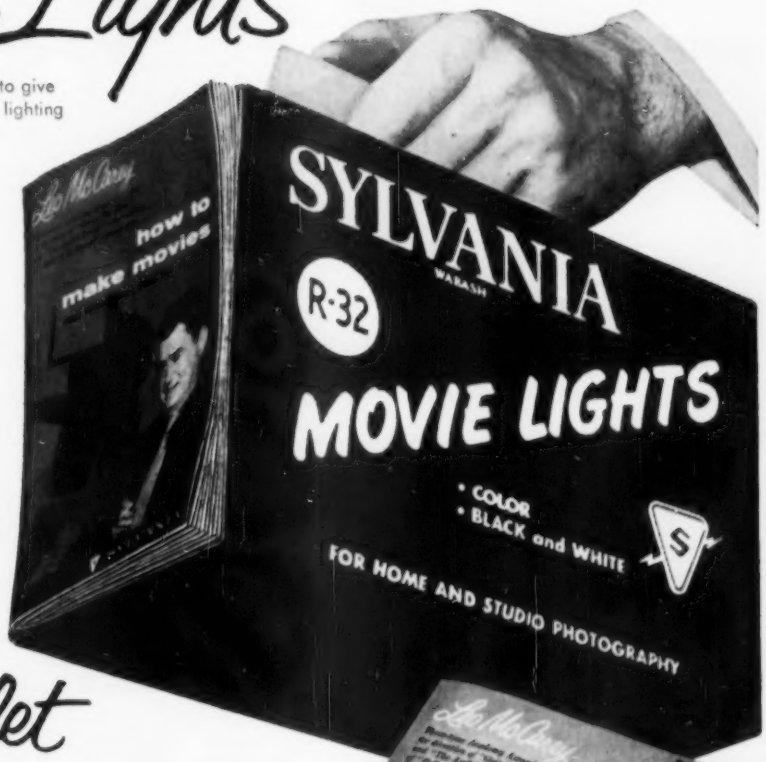
in Movie Lights

specifically made for your home movies to give long-lasting, color-corrected, studio-type lighting



Now . . . in the exclusive Two-Lamp Handy Pack

plus

Free Booklet

that shows you how to make better, more interesting, more professional movies

Get set for your best home movies ever. Equip your bar-light with new Sylvania Movie Lights, today!

Let Hollywood director Leo McCarey, famous 3-time Academy Award winner, help you make better movies of your family. This lavishly illustrated booklet teaches you to shoot as Hollywood shoots . . . includes fascinating easy-to-follow "shooting scripts" . . . glossary of useful movie-making terms . . . hints on titling . . . helpful information on lighting and projection.

Stop in at your dealer's and pick up Sylvania Movie Lights in the new Two-Lamp Handy Pack . . . plus the valuable FREE booklet by Leo McCarey—"How to Make Movies Your Friends Will Coax You to Show."

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SYLVANIA® fastest growing name in sight!

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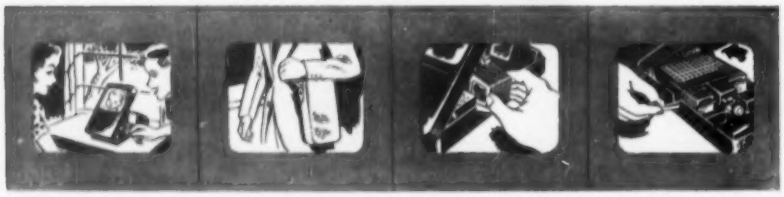
PORT-A-VIEW

for every 35 mm. slide fan — even if you already own an ordinary projector.

ONLY 54.95 COMPLETE

Color-corrected, Coated 3-element f/3.3 50mm. projection lens. TV-type dark screen. AC-DC.

Case extra



No darkened, stuffy rooms. Port-A-View shows your slides brilliantly on its own built-in screen — in ordinary room light. Weighs only 4 lbs.

No moving furniture, setting up bulky equipment. Turns on automatically when cover is opened. Folds like a camera — carry it anywhere.

Port-A-View loads in a second—takes 36 slides at a time. No more tedious pre-loading individual slides into slots or magazines.

Slide changer operates silently, smoothly, speedily at the flick of a finger. Makes slide showing a pleasure instead of a chore.

FREE demonstration with your own slides at your favorite camera store.

Write for free full-color folder.

P1-5 THE FR CORPORATION 951 BROOK AVE. NEW YORK 51, N. Y.

"Basic study of the properties of photographic images leads us to believe that we may be able to decrease the appearance of graininess without actually changing the grain size and, conversely, if this is accomplished we should be able to increase the individual grain size (which contributes to the total sensitivity of the silver-halide grain) without increasing apparent graininess." These facts were part of the inductive reasoning that prompted the speaker to predict that photographic film speeds may increase as much as 100 times in the next 75 years.

Battery Tester. A new service tool, the Eveready Photoflash Battery Tester, is now available to professional photographers and industrial users through distributors of Eveready batteries, which are made by the National Carbon Company of New York. Unlike any instrument of this type which has been available until now, the new tester indicates battery condition over eleven separate voltage ranges. It is useful for 1½-volt general service and photoflash cells, for 22½-volt and 45-volt miniature B batteries used in B-C photoflash service and for electronic-flash dry batteries up to 510 volts. A readily legible color-coded scale indicates whether the battery being tested is "good," "useful," or "ready for replacement." The housing of the instrument measures 6x4¾x2⅜ inches.

Odds & Ends. The new 2.8D model of the Rolleiflex camera is now available, equipped either with 80-mm, *f*/2.8 Schneider Xenotar or Zeiss Planar lens. This new model is distinguished from the Rolleiflex 2.8C by its incorporation of the new Synchro-Compur shutter with cross-coupled linear shutter speed and *f*-aperture scales and the F. Deckel light-value systems (LVS) or simplifying exposure determination. The user can, if he desires, by-pass the coupling between shutter speed and lens opening controls as well as ignore the LVS system and use separate lens and shutter settings.

. . . Kodak has just announced plans to discontinue the production and sale of its Super-XX film in 35-mm, roll and film pack sizes. This has been the direct result of the improvement in emulsion making that has made the production of Kodak Tri-X film practical—a film that is twice as fast as Super-XX "without sacrifice in graininess or quality." Tri-X is now being sold by Kodak whenever maximum emulsion speed is desired; for camera workers desiring a medium speed panchromatic film, Kodak is now recommending its Plus-X film which has recently been increased in speed to an exposure index of 80 daylight and 64 tungsten and which is intended to serve the general-purpose role for which Super-XX had formerly been used.

A new Kodak Panatomic-X film with a thinner emulsion, finer grain pattern and better sharpness characteristics, yet the identical speed as the previously discontinued 35-mm film of the same name —25 daylight, 20 tungsten—has also been announced.

WOLLENSAK

a fine old name in photo-optics . . . a new name in photo equipment

The famous ultra-fine lenses which Wollensak has been making for more than fifty years are now combined with precision photographic equipment of unparalleled quality . . . superbly designed to give you a lifetime of dependable service. The name WOLLENSAK serves as your guarantee of complete satisfaction.

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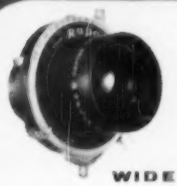
See the complete Wollensak line at the better photographic dealers. Write for new literature.

"18" 8mm PROJECTOR
with Wollensak 1" f/1.6 Wocoted projection lens; finest optical system for brilliance, coverage, definition. 750 watt lamp; 400 ft. reel capacity; self-contained carrying case $169.50
"65" 16mm Projector with case $199.50

WOLLENSAK "58" 8mm SPOOL TYPE CINE CAMERA
with WOLLENSAK 13mm f/1.9 Cine Raptar (focusing mount) Wocoted lens; adjustable optical viewfinder; extra powerful motor; exposure guide; accommodates drop-in filters.
Complete, inc. tax. $124.50

8mm, 16mm CINE RAPTARS
deliver high contrast, edge to edge sharpness, brilliant images. Fully color corrected. Available in speeds from f/1.9 . . . in focal lengths from 6.5mm to 6".



TELEPHOTO RAPTARS
bring distant images up close, enlarged in sharpest detail. True magnification . . . pleasing perspective. Excellent for portraiture.

WIDE ANGLE RAPTARS
Perfectly corrected lenses with ability to cover a wide field without distortion and with critical sharpness.

RAPAX SHUTTERS
The first fully synchromatic shutter made. Unsurpassed workmanship and performance. Also available in Non- and "X" Sync.

PEERLESS *Pre-*

SMASH EVENT! Our LOWEST PRICES of the YEAR! ...IN TIME FOR HOLIDAY BUYING and GIVING!

EASY TIME PAYMENTS... Only 10% Down!

If you choose to buy on "time" . . . there's no increase in our famous low prices! Only 10% down buys anything at Peerless! Buy now — use it, enjoy it as you pay!

WORLD-WIDE PURCHASING POWER!

Because we buy such tremendous quantities, our buyers go directly to the source . . . where ever it may be! Quantity imports are brought to you far below their nationally advertised prices!

HIGHEST TRADE-IN ALLOWANCES!

No one can offer a higher price for your used photographic equipment! No make or model too old! Don't trade until you get our estimate . . . and you'll get our estimate within 24 hours!

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Over 100,000 Photographic Values to Choose From! The World's Largest Selection of Domestic Brands and Quality Imports! If it's Manufactured — Peerless Has It — at the Right Price!

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FREE! SIX TDC SLIDE TRAYS! For Rapid Indexing, Viewing & Storage of 180 Slides With the Purchase of This Slide Outfit!

Three Great Names Combine to Bring You This Spectacular Offer **PEERLESS ★ Bell & Howell ★ TDC**

SAVE $30.05! BRAND NEW!

TDC SHOWPAK

300W OUTFIT

300 W. BLOWER COOLED PROJECTOR OUTFIT COMPLETE WITH CASE, SEMIMATIC CHANGER PLUS SIX TDC SLIDE TRAYS!

- 4" COATED ANASTIGMAT LENS
- ALL METAL CONSTRUCTION
- BLOWER COOLED
- Discontinued Model

TOTAL LIST $66.00!

Complete Outfit Only **35.95**

AT THE LOWEST PRICES EVER! **EXCLUSIVE!**

Hambletonian Binoculars

Brand New 7x50 BINOCULARS
- Prism
- Lightweight
- High Power
- Individual Focus

22.50

- PRISM!
- BRAND NEW!
- HIGH POWER!
- ALL METAL CONSTRUCTION!

Complete With Leather Case & Straps!

High Magnification, Maximum Image Brightness and Large Objective Lenses Make the 7 x 50 Binocular Ideal for:
- NAVIGATION
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7x50 Binocs.—C.F.	24.50	8x30 Binocs.—I.F.	18.50
7x35 Binocs.—I.F.	21.50	8x30 Binocs.—C.F.	20.50
7x35 Binocs.—C.F.	24.50	10x50 Binocs.—C.F.	31.95
8x30 Binocs.—I.F.	15.50	10x50 Binocs.—C.F.	34.95
8x30 Binocs.—C.F.	17.95	6x15 Theatre Glasses	11.25

I.F.—Individual Focus—C.F. Central Focus

Add 10% Federal Excise Tax to all Binocular Prices

IDEAL GIFT FOR GIFT GIVING! 6 x 15 GOLD PLATED THEATER GLASSES
- Prism
- Imported **15.95**

PEERLESS SCOOP! Save 35.05! Brand New! 135mm f4 Ctd. Zeiss Triotar Pre-Set **TELEPHOTO LENS** **49.95** List $85.00—Only at Peerless

NEW LOW PRICE! EXCLUSIVE!

SAVE 207.80! BRAND NEW! Single-Lens Reflex

LATEST 1956 MODELS **HEXACON '35'**

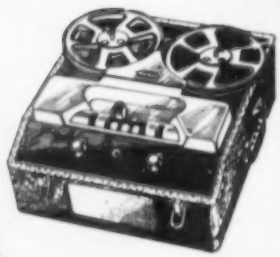
Single-Lens Reflex Camera with f2.8 Ctd. PRE-SET TESSAR — Value $299.75!

- Shutter Speeds from 1 to 1/1000
- Pentaprism Eye-Level Through-The-Lens Focusing
- Automatic Exposure Counter
- Delayed Action Self-Timer
- Built-in Synchronization for Flash and Strobe

91.95

BRAND NEW HEXACON "35" WITH: f2 Coated T.H.C. — Value $400.00 . . 94.95

FREE! $29.75 KODAK B.C. EKTALUX FLASHGUN with each Purchase of: **35mm HEXACON '35'** with f2 Coated Pre-Set C.Z. Lens Value $300.75! **124.95**



SPECIAL PURCHASE! BRAND NEW!

ONLY AT PEERLESS! SAVE UP TO $100.05!

PENTRON PORTABLE TAPE RECORDERS

COMPLETE with MICROPHONE CASE, REELS and TAPE!

Two-Speed, Two-Hour Operation—Recording or Playback
- Instantaneous, Automatic Braking of Both Tape Reels
- Operates Horizontally, Vertically, Even Upside Down
- Fast Forward and Rewind Speeds—40 to 1 Ratio

MODEL CT-1 LIST $129.50! **79.95**

OTHER PENTRON MODELS at AMAZING SAVINGS!

EVERYONE BRAND NEW!... FULL WARRANTY!

	List	Sale
PENTRON TR4 HI-FI 2 SPEED	189.50	104.95
PENTRON HT225 HI-FI 2 SPEED Three Speaker	225.00	124.95

ONLY 10% DOWN! BUYS EVERYTHING PEERLESS OFFERS AT NO INCREASE IN OUR WORLD-FAMOUS LOW LOW PRICES!

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ONLY 10% DOWN Buys Everything PEERLESS Offers ...AT NO INCREASE in our FAMOUS LOW PRICES!

BUY NOW AT THE LOWER PRICE!
BRAND NEW! 500-WATT, BLOWER COOLED
REVERE '888' 2 x 2 SLIDE PROJECTOR
With Sharp f3.5 Coated Lens
Complete with DeLuxe Carrying Case
- Automatic Slide Changer Shows 36 Slides as Slow or Fast as You Like
- Automatic Fade-in and Fade-out
- Positive Tilt Control
- Lightweight and Compact
- 500 W. Lamp

PRE-PRICE-RISE SPECIAL
119.50...or 11.95 Down
Easy Terms Free Postage!

BRAND NEW! THE INCOMPARABLE LATEST MODEL 4 x 5
Linhof Super Technika
127mm f4.7 Ctd. Xenar Lens in MX Compur Synchro Shutter
with Universal-Revolving Back • Ekalite Field Lens

- Multi-Focus Rangefinder Couples to as Many Lenses as Desired
- 3-section Track Assembly
- Triple Extension Bellows
- Rapid Lens Interchangeability

329.75 ... or 32.98 DOWN
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The Very Latest! Brand New! Cine-Kodak 'Showtime' 8mm Movie Projector

Complete With Case
Capable of really big 8mm movies . . . . projects up to 5' wide and larger!
• ated f1.6 Lens • 500-Watt Lamp
• Blower Cooled • 400' Capacity
• Micro-Focusing • Nylon Gear Driven Still & Reverse
Only 115.00 . . . or 11.50 Down
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Free Postage!

JUST OUT! LATEST 1956 MODEL!
BRAND NEW! WITH LIGHT VALUE SCALE!
Auto Rolleiflex 2.8D

With Coated f2.8 Xenotar Lens and Synchro-Compur MX Shutter
- Shutter Speeds to 1/500 Second
- Synchronized for Standard and Electronic Flash
- Delayed Action Self-Timer
- Double Exposure Prevention
- Auto-locking MX Synchro Lever

291.50 . . . . . or 29.15 DOWN
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IT'S HERE! EXCLUSIVE WITH PEERLESS
BRAND NEW! THE ORIGINAL, AUTHENTIC
VIDOSCOPE
16mm CinemaScope
TAKING and PROJECTION LENS
Fits All 16mm Cameras and Projectors
True 2.55 to 1 CinemaScope Ratio

- Gives you over 100% Wider Picture than Standard Lenses
- Cylindrically Ground, Scientifically Perfect, Far Brighter and Sharper than any other Prismatic Device
- Can be Used with Still Cameras

195.00 . . . . . or 19.50 DOWN
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JUST OUT! Brand New! 8mm Kodak Brownie TURRET Movie Camera
3-Lens Versatility for The Price of One!

Never before a turret camera so simple to use . . . or available at such a low, low price!
• Fast f1.9 Coated Lens
Complete With Wide Angle and Tele
• Full-View Finder Shows Fields for Standard, Wide Angle and Tele Shots
Only 79.50 . . . or 7.95 Down
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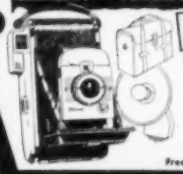
SENSATIONAL COMBINATION OFFER!
YOU SAVE $17.03 ON THIS BRAND NEW OUTFIT!
Polaroid Highlander
CAMERA ★ FLASHGUN ★ 2 ROLLS OF FILM



Plus Leather Pak-All Case **76.25** List $93.28!
Complete Outfit Includes:
- Polaroid Highlander Picture-in-a-Minute Camera
- Rugged-Duty Flashgun
- 2 Rolls of Polaroid Film
- Diamond Pak-All Case. Genuine Leather. Accommodates camera plus all accessories.

Order Now! Immediate Delivery!
Free Postage! Camera Only 69.95

SUPERLATIVE NEW MODEL!
BRAND NEW! 750 WATT, BLOWER COOLED
8mm REVERE '777'
MOVIE PROJECTOR
With Sharp f1.6 Lens
Complete with Carrying Case

- One Simple Control Instantly Changes Forward Projection to Reverse
- Fast, Positive Power Rewind
- Smooth, Precise Tilt Control
- Lifetime Lubrication
- Choice of 500 or 750 Watt Lamp

127.50 . . . or 12.75 DOWN
Free Postage! Easy Terms

IT'S HERE! Brand New! Cine-Kodak 'Medallion' 8mm Movie Camera
With f1.9 Coated Lens

The Greatest 8mm Camera Kodak has ever built . . . yet amazingly low priced!
• Magazine Loading • Variable Speeds
• Single-Frame Exposures • Interchangeable Lenses
• Simplified "Red-Dot" Lens-Setting
Only 144.50 . . . or 14.45 Down
Easy Terms
Free Postage!

Smallest Precision Camera in the World!
BRAND NEW! LATEST MODEL! THE FABULOUS
MINOX IIIS

With Fast f3.5 Coated Lens
Complete with Case and Chain
- Small, Compact Size — weighs only 2½ oz.
- Focuses from 8" to Infinity
- Rapid Film Transport
- Double Exposure Prevention
- Eye-Level Viewfinder
- Internal Flash Synchronization

Free Postage! **139.50 . . . . or 13.95 DOWN**
Easy Terms

BUY NOW at the NEW LOW PRICE!
BRAND NEW! VERSATILE, COMPACT 2¼ x 2¼
GRAFLEX '22'
TWIN-LENS REFLEX CAMERA
With f3.5 Coated Graftar Lens

- Takes 12 exposures on economical 120 roll-film
- Century XFM Shutter, with Speeds from 1/10 to 1/200 second
- Synchronized for Standard and Electronic Flash

74.50 . . . . . or 7.45 DOWN
Free Postage! Easy Terms

Brand New! LATEST MODEL! Ascor-Light ELECTRONIC FLASH UNIT
MODEL A-201

- 75-Watt-Second Input
- Weighs just 2-lbs, 2-oz.
- Recycles in 3 seconds
- Kodachrome Guide Number: 45
- Complete with Reflector, Dry Battery Pack, Strap, and 'L' Bracket

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Exclusives! Special Purchases! New & Used Values!

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YOU SAVE $27.80 ON A BRAND NEW
Kodaslide Highlux III
300 WATT SLIDE PROJECTOR
With 5" f3.5 Coated Ektanon Lens
PLUS BLOWER CASE
List $54.75! **26.95**
• High Light Output • Built-in Elevation • Sturdy Construction • Discontinued • Fan-Cooled for Slide Projection • Ready Access to Optics • Long Cord • Easy to Use
Ship. Wt. 10 lbs.

NEW LOW PRICE!
EXCLUSIVE!
SAVE $45.55! ON A BRAND NEW 2¼ x 2¼
PEERFLEKTA II
TWIN-LENS FOCUSING REFLEX WITH f3.5 COATED LENS
A $69.50 Value! **23.95**
• Built-in Flash Synchro • Sportsfinder • 9 Speed Shutter 1 to 1/200 Sec. • Body Shutter Release • Double Exposure Prevention • Matched Ctd. Lenses are Coupled in Helical Mount • Accepts 120 Roll Film.
Ship. Wt. 7 lbs.

PEERLESS SPECIAL PURCHASE!
You Save $41.55 On A Brand New! Exclusive German Import!
35mm WELTI I
with f2.9 MEYER TRIOPLAN LENS
List $67.50!
PEERLESS' LOW LOW PRICE . . . **25.95**
• 9 Shutter Speeds — 1 Sec to 1/200 • Built-in Flash • Double Exposure Prevention • Parallax Corrected Viewfinder • Auto Film Counter • Body Shutter Release • Helical Focus Mount • Depth of Focus Scale • Tripod Socket
Ship. Wt. 5 lbs.

Our Greatest 8mm Movie Buy Ever!
ABSOLUTELY BRAND NEW CAMERA & PROJECTOR BOTH FAMOUS NAMES • FULLY GUARANTEED!
Reg. $59.95! Famous German Make
8mm AK-8 MOVIE CAMERA
with f2.8 C.Z. Ctd. Triotar Lens
• 7½ Ft. Spring Drive • No Run Down-Auto Stop • Audible & Visual Footage Counter • Regular Single-Frame & Continuous Run • No Thread Spool Loading • Removable Pressure Plate For Instant Cleaning • All Metal Die-Cast Housing • Large Optical Finder • Hand-Crank Socket for Dissolves, Titling, Etc.
The Camera
The Projector
The $79.95 List! Brand New!
B & H MONTEREY
8mm MOVIE PROJECTOR
• 5" Color Corrected Lens • Blower Cooled • Lightweight • 300 W. Lamp • Sturdy
PROJECTOR ONLY 70.00
$139.90 Value! BOTH FOR ONLY **97.50**

YOU SAVE $49.50 ON A USED
KODAK SIGNET
★ CAMERA ★ CASE ★ FLASHGUN
f3.5 Coated Ektar Lens
List $91.45
• Flash Synchronized • Double Exposure Prevention • Coupled Rangefinder & Viewfinder
Ship. Wt. 5 Lbs. **41.95**

YOU SAVE $24.00 ON A USED
BELL & HOWELL 220
8mm MOVIE CAMERA
f2.5 Coated Lens
List $49.95!
• "Sun Dial" Lens-Setting Device • Continuous and Single Frame
Ship. Wt. 5 Lbs. **25.95**

SAVE $50.80! USED, FAMOUS
POLAROID Camera
"PICTURE-IN-A-MINUTE"
with Coated Lens
List $89.75!
• Focuses from 3¼ Feet to Infinity • Takes 3¼" x 4¼" Pictures • Built-in Flash Synchronization
Ship. Wt. 10 Lbs. **38.95**

YOU SAVE $150.50 ON A BRAND NEW
KINE EXAKTA VX
with f2 Coated C.Z. Prosot Lens
List $335.00
• Built in Synchronization Flash & Strobe • 29 Shutter Speeds from 12 to 1/1000 Seconds • Built-in Self-Timer • Interchangeable Lens Mount • Discontinued
Ship. Wt. 5 Lbs. **184.50**

NEW LOW PRICE!
YOU SAVE $34.00 ON A BRAND NEW
TIMEX MAGNETIC DISC RECORDER OUTFIT
Complete With Microphone, Radio-Phono Cord, Eraser Magnet and Recording Disc!
• Records directly from Radio, Phonograph and TV • Recording Discs can be re-used 10,000 times • Adapts to play 45 RPM records
List $59.95! **25.95**

A PEERLESS EXCLUSIVE!
YOU SAVE $37.00 ON A BRAND NEW
35mm RIVAL '35'
with f2.9 Coated Lens
Value $59.95
• 9 Shutter Speeds to 1/250 Sec. • Built-in Flash Synch. • Double Exposure Prevention • Parallax Corrected Viewfinder
22.95

YOU SAVE $45.55 ON A USED
35mm ARGUS C-4
with f2.8 Coated Lens
List $89.50!
• Coupled Rangefinder • Built-in Flash Synchronization • Double Exposure Prevention
Ship. Wt. 5 Lbs. **43.95**

SAVE $46.60! USED! LATEST MODEL!
ROLLEICORD V
with f3.5 Coated Xenar Lens and Full Flash Synchronization
Quantities Limited!
List $134.55
• Compur Rapid Shutter • Delayed Action Self Timer • Speeds 1 to 1/500 Sec. • Cross Coupled Linear Scales
Ship. Wt. 7 Lbs. **87.95**

YOU SAVE $33.25 ON A USED
LA BELLE '55'
2 x 2 SLIDE PROJECTOR
f3.5 Coated Lens
List $81.20!
• 500 Watt Lamp • Blower Cooled • Automatically Feeds and Changes Slides
Ship. Wt. 16 Lbs. **47.95**

SAVE 90.45 USED! WORLD-FAMOUS
B & H Autoload 200-A
16mm MOVIE CAMERA
List $199.95!
with f1.9 Coated Lens
• Magazine Load • Variable Speeds
Ship. Wt. 5 Lbs. **109.50**

SENSATIONAL SAVINGS ON . . .
FEDERAL Enlargers
YOU SAVE $17.80 ON A USED
FEDERAL 269
with 3½" Coated Lens
List $39.75 **21.95**

	List	Used
FEDERAL 279 Condenser Enlarger	46.95	25.95
FEDERAL 311 with 3½" f4.5 Lens	69.25	39.95

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ONLY A PARTIAL LIST OF GREAT BUYS . . .
IF YOU DON'T SEE IT—WRITE—WE HAVE IT!

LEICA, CONTAX, NIKON, CANON

	New	Used
Canon IV S 2 f1.8 Serenar	$284.00	$128.95
Contax I f2.8 Tessar		41.95
Contax II f2 Sonnar		77.95
Contax III f2 Sonnar		103.95
Contax IIA f1.5 Sonnar ¢*	374.00	159.95
Contax IIIA f2 Sonnar ¢*	383.00	178.95
Contax IIIA f1.5 Sonnar ¢*	412.00	188.95
Leica IIIC f3.5 Elmar ¢		85.50
Leica IIIC f2 Summitar ¢		114.50
Leica IIIF f3.5 Elmar ¢*	237.00	127.50
Leica IIIF f2 Summicron ¢*	336.00	171.95
Leica IIIF f1.5 Summarit ¢*	357.00	174.95
Nikon f2 Nikkor ¢*	269.00	109.00
Nikon f1.4 Nikkor ¢*	299.95	159.95

35mm SINGLE LENS REFLEX

Exa f2.8 Westar MXc*	$ 85.00	$ 41.95
Exakta V f2 Biotar MXc*		98.95
Exakta VX f2.8 Auto Westanar	239.50	148.95
Exakta VX f1.9 Auto Xenon	341.70	189.95
Contaflex f2.8 Tessar Auto RF ¢*	169.00	81.95
Contax D f2 Biotar	199.00	89.95
Rectaflex f2 Xenon RF ¢*, case & shade	350.00	119.50

35mm CAMERAS

Argus 21, f3.5c*	$ 49.95	$ 29.50
Bolsey B-2 RF, case and flash	66.50	26.95
Bolsey C22 f3.2 Reflex RF ¢*	99.50	56.95
Contessa, f2.8 Tessar ¢*	142.50	72.95
Graphic 35, f3.5c*, Case and Flashgun	89.75	53.95
Kodak Flash Bantam f4.5 ¢*	56.00	23.95
Kodak Pony 828 f4.5 C*	29.50	14.50
Kodak Pony 135 f4.5 C*	29.75	17.50
Kodak Retina II f2 Xenon RF		52.50
Kodak Retina IIA RF MXc*	127.50	69.95
Kodak Town & Country f3.9 RF case & flash	75.00	43.95
Kodak Auto Retina III C f2 Xenon*¢	190.00	115.95
Minox IIIS chain & case*	139.50	78.95
Minox II f3.5c		48.50
Voigt Prominent f2 RF MXc*	220.00	124.95
Voigt Vitessa f2 RF MXc*	127.50	72.95
Voigt Vito II f3.5c*	54.50	23.95
Voigt Vito III f2 RF MX*	119.50	68.95

35mm STEREO CAMERA

Iloca II f3.5c*	$ 69.50	$ 48.95
Kindar f3.5 RFc*	99.50	58.95
Kodak Stereo f3.5c*	84.50	46.95
Revere f3.5 RFc*	174.50	73.95
Stereo Realist f3.5 RFc*	159.00	64.50
Stereo Realist f2.8 RFc*	198.50	106.95
TDC Colorist f3.5c*	99.99	68.95

2¼ x 2¼ REFLEX CAMERAS

Ciroflex D f3.5c	$ 75.00	$ 33.95
Ciroflex F f3.2 MXc*		66.95
Graflex 22 f3.5 C*	93.00	44.95
Hasselblad f2.8 Ektar/1600 C*	476.00	278.95
Hasselblad f2.8 Ektar/1000 F	379.50	196.95
Ikoflex IIA Auto f3.5 Tessar MXc*	126.00	72.95
Kodak Reflex II f3.5c*		55.95
Richoflex f3.5c*	39.95	19.95
Rolleicord III f3.5 Zeiss*		58.95
Rolleicord IV f3.5 Xenar MXc*	149.50	64.50
Latest Auto Rollei III f3.5 Xenar MXc*	234.50	133.95
Latest Auto Rollei III f3.5 Tessar MXc*	249.50	143.95
Latest Auto Rollei 2.8 C f2.8 Xenctar MXc*	309.50	175.95

(Symbols: RF Coupled Rangefinder, ¢ Coated, * Flash Shutter)

Highest TRADE-IN ALLOWANCE
Only 10% Down • EASY TERMS!

NEW LOW PRICE!
Save $34.55! Brand New! Latest Models! Factory Packed!
THRIFT-LITE IIX ELECTRONIC FLASH UNIT
List $59.50! COMPLETE **24.95**
Ship. Wt. 5 Lbs.
• Super Fast Flash 1/1000 Sec. • Completely Portable • Unit Weighs Only 1.7 lbs. • 60 Watt Seconds • Complete One Piece Unit

ACCESSORIES FOR THRIFT-LITE	List	Sale
BATTERY PACK	24.50	14.95
EXTENSION LIGHT	29.95	21.00
INTENSIFIER (Doubles Light Output)	24.50	14.95

PLEASE STATE NAME OF CAMERA WHEN ORDERING

ONLY 10% DOWN! BUYS EVERYTHING PEERLESS OFFERS AT NO INCREASE IN OUR WORLD-FAMOUS LOW LOW PRICES!

Holiday Sales!

and Only 10% Down Buys Everything Peerless Offers!

PEERLESS SUPER BUYS!

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ONLY A PARTIAL LIST OF GREAT BUYS . . . IF YOU DON'T SEE IT—WRITE—WE HAVE IT!

8mm CAMERAS

	New	Used
B&H 134V f2.5ε	$ 89.95	$ 38.95
B&H 134TA f1.9 Turε	159.95	98.95
B&H 172A f1.9 Mag. Turε	199.95	117.95
B&H 252 f2.3 Montereyε	59.95	37.95
Bolex C 8 f2.8 Yvarε	89.50	Used 62.95
Bolex H 8 De Luxe f1.9 Turε	269.50	Used 142.95
Kodak Brownie f1.9ε	46.75	31.95
Cine Kodak Reliant f2.7ε	84.50	51.95
Cine Kodak Magazine f1.9ε	149.50	68.95
De Jur Citation f2.5ε	77.50	37.50
De Jur Embassy W 5 Magε	106.95	56.95
Keystone K-32 Olympic f2.5ε	79.95	45.95
Keystone Bel Air f2.5 Magε	89.50	46.95
Keystone Riviera f1.9 Mag Turε	139.95	91.95
Revere 50 f2.8ε	49.50	22.95
Revere 88 f2.5ε	74.00	31.95
Revere 80 f2.5ε	97.50	42.95
Revere 84 f1.9 Turε	147.50	83.50
Revere 67 f2.8 Mag Turε	119.50	58.50
Revere 40 f2.5 Magε	99.50	51.50
Revere 44 f1.9 Mag Turε	154.50	91.95
Revere 863 f25 Mag Turε	142.50	83.50

8mm PROJECTORS

B&H 221 500 W Case	$ 84.50	$ 44.95
B&H Regent 500 W Case	179.95	91.95
De Jur 750 W Case	159.50	74.95
Keystone K70C Brightbeam 500 W Case	69.50	39.95
Keystone K95, 750 W., Case	119.50	68.95
Revere 85, 500 W., Case	124.50	56.50
Revere 90, 750 W., Case	159.50	65.50

ROLL FILM CAMERAS

Kodak Chevron f3.5 RF 800 MX*	$198.50	$128.95
Kodak Medalist II f3.5 Ektare*	304.75	105.95
Polaroid Pathfinder f4.5 RF	249.50	145.95
Super Ikonta BX f2.8 Tessar RFε*	163.00	99.50

PRESS CAMERAS

2¼x3¼ Pacemaker Speed f4.5 KRFε*	$313.95	$146.95
3¼x4¼ Pacemaker Crown f4.7 KRFε*	267.45	139.50
4x5 Pacemaker Crown f4.7 KRFε*	315.45	138.95

SLIDE PROJECTORS

Argus PB 300, caseε	$ 48.50	$ 23.95
Argus Automatic 300.ε case	66.50	36.95
Gold Manumatic 300 Wε	58.50	24.95
Gold Coronet 300 W. caseε	44.75	21.95
Gold Reflex 300 W case 2¼ε	86.50	48.95
Kodaslide Signet 500 Wε	72.50	45.95
Kodaslide Table Viewer 4x	37.50	26.95
LaBelle 55 Automatic 500 Wε	95.00	48.95
LaBelle 75 Auto Remote 500 W caseε	154.95	94.95
Revere 444 300 Wε	69.50	28.95
Revere 555, 500 Wε	79.50	49.95
Revere 888, 500 Wε	119.50	68.95
TDC Headliner 300W Semimatic ε	49.99	21.95
TDC Streamliner 500W Semimatic ε	84.50	47.95
TDC Duo 300ε, 2¼x2¼	67.50	33.95
TDC Model D, 300 Wε	67.50	33.95
TDC Project-or-View 200Wε	77.50	47.95
TDC Stereo Projector 500Wε	169.50	98.95
TDC Stereo Projector View 300Wε	144.50	92.95
Viewlex V33L 300Wε	67.00	38.95

(Symbols: RF Coupled Rangefinder, ε Coated, * Flash Shutter)

Highest TRADE-IN ALLOWANCE
Only 10% Down • EASY TERMS!

You SAVE $6.00 On A BRAND NEW
DeJUR 5B EXPOSURE METER
List $15.95
9.95

Complete with Case!
• For Black & White, Color, Movie or Stills
• Stop Range from f1.4 to f45
• ASA Indexes from 8 to 800
Limited Quantities

	List	Used
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35-mm today

By Bob Schwalberg

Product tests provide valuable experience

Of all photographers, the 35-mm man is probably most concerned with the improvement of his photographic tools and techniques. New ideas in the design of cameras, lenses, films, and developers that hardly cause a ripple among the 2¼x2¼ and 4x5 sets immediately evoke flurries of excited comment and activity in the 35-mm camp. And recent years have witnessed exciting improvements in every corner of the 35-mm man's kit. The truth is, however, that in spite of all the wonderful advances that have been made, the 35-mm photographer, alone among the film users, is basically dissatisfied with his equipment and materials and techniques.

One rather ironic cause for this dissatisfaction is the traditional adoption of 35-mm ideas, materials, and techniques by followers of the larger film formats. A most exasperating instance occurred shortly after the Adox high-resolution, super-fine-grain thin-films had seemed to have closed the gap between the 35-mm camera and its bigger brothers. Roll-film versions of Adox KB-14 and KB-17 appeared on the dealers' shelves. And, as if this wasn't bad enough, 4x5 and other cut-film versions are available in Germany!

FOUR EXPOSURE CONTROLS IN TESTING FILM EXPOSURE AND DEVELOPMENT

1. Subject and subject conditions must not vary during the test.

2. Lighting direction and intensity must remain perfectly constant.

3. Exposure-meter technique must be consistently uniform.

4. Camera angle and distance must not vary and exposure variations should be made with the lens diaphragm rather than the camera shutter.

• See text for details

Let's face it! As long as every optical, mechanical, and chemical advantage designed for 35-mm is shared with the larger film formats, our 24x36-mm negatives possess a built-in handicap. The natural result is to compel the 35-mm fraternity to exercise greater skill, care, and control in order to keep the image-quality differential as small as possible.

The constant quest for superior 35-mm equipment, materials, and techniques finds its expression in the enthusiasm with which so many 35-mm photographers spend so many hours (and dollars) experimenting with new lenses, films, developers, etc. But not all of this testing is productive. Many photographers' testing procedures are inadequate and lead to serious errors. Others make testing and experimenting a complete end in itself, and while they may mass much esoteric data about film and developers, they hardly ever find the time or the stamina to use them to better purpose.

An intelligent approach to testing, which, after all, is merely the personal evaluation of photographic merchandise, can pay off with three very valuable dividends. They are:

1. *The ability of the photographer to analyze and evaluate products of immediate personal interest, instead of having to rely solely upon manufacturers' advertising slogans and claims.*

2. *Teaching the photographer to get the most from his existing equipment and materials.*

3. *Providing important knowledge and self-confidence by compressing a lot of technical experience into a short period of time. Only the photographer who has perfected his individual technique until it is seemingly second nature can forget about technique and concentrate completely upon his subject matter.*

In approaching the subject of "testmanship" we must first recognize certain minimal principles. An experiment should contain only one variable. It should simulate, as closely as possible, the actual shooting conditions it seeks to analyze. The experiment should be relevant to the equipment or materials being tested. And, it must include "yardsticks" or controls by which to measure the results.

We must, at all costs, remember that we're practical photographers and not be unduly influenced by the scientists, who, unfortunately, speak an altogether different language. Probably the most interesting conflict between the sensitometrists and the photographers has to do with available-light photography. These laboratory types see little difference between the vast majority of the developers on the commercial market today. They say, with scientific accuracy, that all developers will yield approximately the same emulsion speed with a given film.

Now, of course, once you get out of the lab and into the real world where films and developers are used to make pictures instead of sensitometric exposure wedges, neither of these things is true at all.

There are differences between developers. These differences include grain type and graininess, over-all negative contrast and contrast within the less-well-exposed shadow regions, detail resolution, and effective film speed. If, for example, we can take Plus-X, which has a tungsten

(*Continued on page* 186)

Uncover hidden color beauty...

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RADIANT SCREEN

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For your color movies, color slides, stereos...

ideal for black and white, too!

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Give one of the new Radiant Screens as a gift—and you will earn the lasting gratitude of anyone who projects pictures. It is "something different," attractively packaged—just ideal for Xmas, and all other gift occasions. Every showing on a Radiant Screen will remind the recipient of your good judgment!

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The beautifully designed lamphead is hardly wider or deeper than a king-size cigarette; hardly higher than a reflex camera; weighs just 1½ pounds. It's perfectly balanced for easy handling both on and off camera.

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*Strobonar transparency by Candance Bannister

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But does he have a camera that gives him a finished print 60 seconds after he takes a picture? Does he have a camera that gives him a second chance – that lets him see his results right on the spot so he can take a picture right over if somebody made a face or the composition wasn't just right? Does he have a camera that's so much fun to use that you can build a whole party around it–or make new friends on vacation in less time than it takes to introduce yourself? Does he have a camera that uses the newest kind of film in the world – a film so fast you can take delicate pictures in soft light, pictures that never before were possible? Does he have a camera that's so versatile, so useful in so many ways...that three out of five owners use it in their work as well as for fun?

There is no end to the advantages of owning a Polaroid Land Camera. You can do things with it that are just downright impossible with any other camera. It's the only camera of its kind in the whole world.

Even if he already has a *couple* of cameras – think about getting him one of these. It's the most exciting Christmas gift you can give him. You can put it under the tree with his name on it for as little as $1.19 a week. Drop into any camera dealer's for a demonstration. Ask to see the sample Polaroid Land pictures he has. And if you've got a spare minute, let him take your picture. You'll be sold. Left to right: Polaroid Highlander, $69.95; Pathfinder, $249.50; and Speedliner, $89.75.

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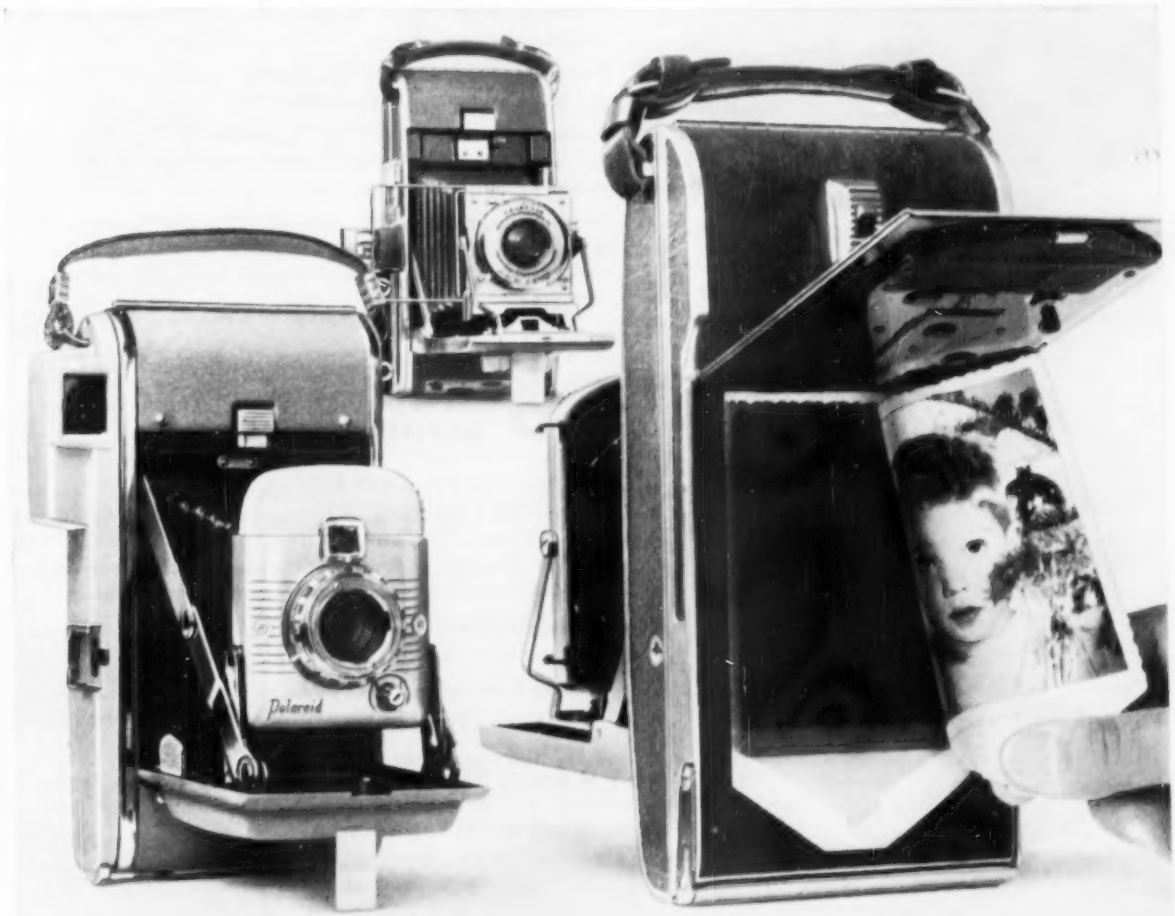

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500 FOR 2x2 SLIDES

The new AO 500 is your brightest buy among all 500 watt slide projectors. It provides maximum illumination to the very edges of the screen. Even the slightest detail shows up with brilliant clarity. Buy this professional AO 500 and have the best.

Sharp focus is simple and easy with the positive spiral action.

Precision optics exclusive, all-coated lens system. 5″ focal length.

Perfect cooling Motor driven fan keeps housing and slides cool. AO patented heat filter protects slides.

Powerful 500 watt lamp reproduces slides with greatest clarity and sharpness. The performance exceeds that of many projectors of higher lamp wattages.

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300 SLIDE PROJECTOR

For 2 x 2 slides this 300 watt 5″ focal length AO Projector features the exclusive AO coated lens, 2 element condensing system, and standard automatic slide changer. The all-metal construction with an attractive "Starlite" gray baked enamel finish has a smart, modern appearance. Buy it for the best in home projectors.

Unusually bright picture Regardless of price, no other projector can surpass the uniform picture brilliance from edge to edge.

Cooler running Patented heat filter permits slide to be left in for hours without scorching. Special blower system keeps the housing cool to the touch.

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THE FIRST AUTOMATIC SLIDE-VIEWER ON THE MARKET

The AO Action-Vue holds up to 25 slides, inserts and ejects them **automatically.** Slides stay in the correct order for successive viewings. Big sized specially designed leak-proof batteries eliminate possibility of corrosion.

The AO Action-Vue promises to be the hottest item for this Christmas' sales. Made of Dow polystyrene plastic, it is practically unbreakable. Precision ground plastic lens produces images with 3-D effect.

This is the first automatic viewer on the market. Makes an excellent gift — but be sure you have one for your very own.

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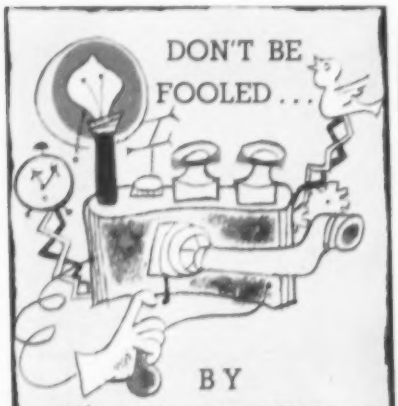

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GIMMICKS!

This contraption is good for laughs, but not for pictures. Some cameras get your interest with confusing, "do-nothing" gadgets that make you think you're getting a lot of camera for your money. But to pay for the trimmings, they leave out the "guts" . . . because something's got to give to keep the price attractive. If you want a camera designed with just one thing in mind, producing fine pictures . . . look at Konica!

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Meet the prize winners

in our 1955 international picture contest

IN THIS year's Contest, as in our previously-held Contests, amateur and near-amateur photographers won most of the prizes. Entries came from almost every country in the world, and for the first time in the history of these Contests, there was a tie—for fifth prize, black-and-white. Duplicate prizes were awarded. Here are brief biographical data on the top winners—in color and in black-and-white.

First prize in the black-and-white division was awarded Hideichiro Katayama for his dramatic photograph of the turbulent quality of a *Hadaki-Matsuri Festival (pages 102-103)* in his native Japan. Katayama, a press photographer, was born in Osaka, where his parents still reside. When he was about twelve years old he received his first camera and he has been a photographic enthusiast ever since that time. A number of his pictures have been published in Japan, principally in newspapers. Katayama is a graduate of Kansai University, is single, and lives in the city of Nagoya, Japan.

Katayama

Michael A. Mardikes' shot of a group of Mexican fishermen adjusting a *Tangled Net (pages 104-105)* won second prize in black-and-white for him. Mardikes is a supervisor in the Quality Control department of Ford Motor Company's Aircraft Plant in Claycomo, Missouri. He has been taking pictures for about seven years, and finds photography an engrossing hobby. His birthplace was Coffeyville, Kansas, and he attended Coffeyville Junior College and the University of Kansas. He also studied at the Kansas City Art Institute and School of Design, and received some training in photography at the Signal Corps' Photographic School during his Army Service. Mardikes and his wife and two children live in Kansas City, Missouri. Three other of his black-and-white pictures are among this year's winners.

Mardikes

His portrayal of three dreamy-eyed *Gypsy Girls (page 106)* won third prize in the black-and-white division for Otto Daettwyler, a free-lance photographer. Examples of Daettwyler's work have been published in POPULAR PHOTOGRAPHY and a number of other magazines, and in photographic books. He has been a consistent salon exhibitor and winner of photographic awards and prizes, including several in an earlier contest held by POPULAR PHOTOGRAPHY. He is a native of Switzerland, and attended schools in Zurich, then the Ecole des Beaux Arts in Paris. With his wife and two little daughters. Daettwyler lives in Menziken, Switzerland. He has two other prize-winning pictures in this contest.

Daettwyler

Fred S. Schiffer was awarded fourth prize for his symmetrically-posed black-and-white portrait of a *Nude (page 107)*. Schiffer, who is owner of a studio in Buenos Aires, has been a photographer for twenty years, and is well-known in photographic circles. He has received many honors and awards in photography, is an Associate of the Institute of British Photographers and a Fellow of the Royal Photographic Society, and holds membership in several other photographic organizations. His work has been published in numerous books and magazines in various countries. Schiffer was born in Vienna, is married, and has two children.

Schiffer

John Rogers' interesting shot, *Parade (pages 108-109)* is one of the two pictures which tied for fifth prize in the black-and-white division. Rogers has a studio in Dallas, Texas, and specializes in advertising and magazine photography. His work has appeared in various magazines and newspapers editorially, also. Rogers was born in Tulsa, Oklahoma, received his early education there, and he attended the University of Tulsa before he entered the United States Army. At the termination of his Army service, he enrolled at the Art Center School in Los Angeles, where he studied for three years. Rogers is unmarried and lives in Dallas.

Rogers

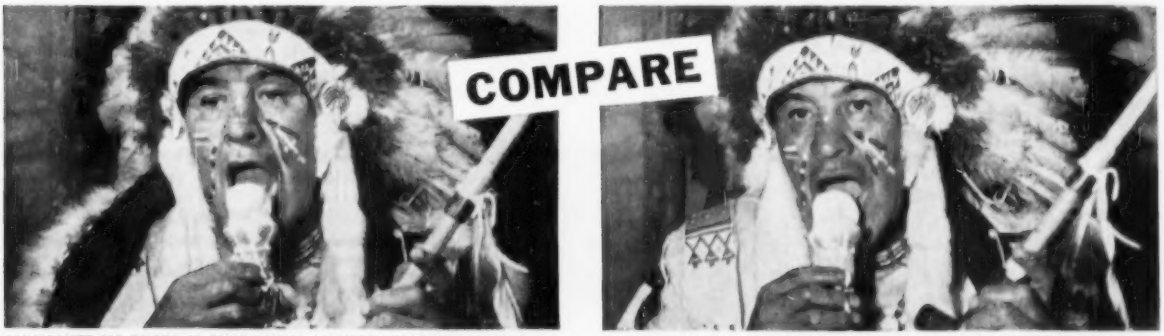
Antonio Migliori, whose unusual black-and-white photograph titled *Summer Evening (pages 110-111)* tied for fifth prize in this division, is an amateur who has been making photographs for about two years. During that time some of his work has been published in several magazines in Italy, and he has handled photographic assignments for some local newspapers and periodicals. A number of his pictures have been entered in salons and exhibits, and he has received various photographic mentions and awards. Migliori, who is manager of a leather goods factory, lives in Bologna, Italy, the city in which he was born. He attended schools there and received a degree in electrical engineering. He is married and has one son and one daughter.

Migliori

(*Continued on page* 64)

flash! New G-E PowerMite M2 is 1/4 size of midget flash bulbs, costs 3¢ less

flash! Gets pictures as good as bigger bulbs



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General Electric's new PowerMite M2 is the world's tiniest, handiest, lowest-cost flash bulb! Only ¼ the size of regular midget bulbs, it is so small that two 12-bulb packs fit pocket or purse. You can carry bulbs by the dozens, be ready always for sudden picture opportunities. At 9¢* each, PowerMites save you 3¢ a shot, up to 36¢ a roll of film. You get 25% *more* flash shots for your money! And you don't sacrifice picture quality. In recent tests, camera fans found that PowerMites get results as good as, *or better than*, bigger, costlier bulbs.

General Electric PowerMite M2's are the world's easiest to use. Ring-type base plugs in, pops out without twisting. Some cameras come equipped for tiny PowerMites. Others use low-cost adapter, about 22¢, available at your dealer's. PowerMites are perfect for indoor and outdoor photos at distances up to 15 feet. Great for color close-ups, too. General Electric's thinner filament and supersensitive primer makes them *sure-fire*, shot after shot. Try a handy 12-bulb pack at your dealer's today, and shoot better for *less* with General Electric PowerMite M2 — the tiny bulb with the giant flash!

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IN POCKET-SIZE
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How to do it better... more easily... with more fun

IMPROVING PRINTS LARGER THAN 8x10

Just about this time of the year darkroom activity is at its annual high point. Summer's best negative finally gets its chance for glory in the enlarger—and we hope everyone is truly thrilled with the splendour of his "blow-ups."

In making prints larger than 8 x 10, the "men get separated from the boys"; the larger the print, the more obvious its flaws. If you're a bit concerned over any lack of sharpness and "grainy" look to your exhibition prints, you might want to think about what those same prints would have been if you had used a really fine grain developer—like FR's X-33B Fine Grain Developer for All Films.

No matter what favorite film you loaded up with, X-33B would have been an ideal choice. It does its job without sacrificing your precious emulsion speed, a fatal flaw in most fine grain developers.

Start off now with a quart bottle of X-33B.

ABSOLUTELY POSITIVELY SHARP

But if it's SHARPNESS you're after—and you're anxious to load your camera with one of the new thin-emulsion films like Adox or Ilford, then you'll need one thing more—FR's X-22 Concentrated Compensating Developer.

X-22 and thin-emulsion films go together like Siamese twins. Developing the thin-emulsion films in ordinary or fine-grain developer is like driving a car on four flat tires.

X-22 is a special formula that most photographers could not even mix for themselves since camera stores don't even stock the chemicals. *Leica Magazine*, which prints the latest poop on 35mm technics thought that FR's X-22 was so terrific that it was featured in a recent issue. Get some at your dealer, 3 packets for 75c. Try it with one of the special films and make yourself a mural!

TAKING PIX WITH A CANDID DEVELOPER

With FR's X-500 Developer for Available Light Photography, an f4.5 lens is really about f2—and an f3.5 lens is about f1.5! This powerful developing agent adds the equivalent of three stops to regular emulsion speed, permits you to rate Tri-X, for example, at ASA 2000 outdoors! Indoors you can easily get ASA 800—sometimes ASA 1000, depending on the color of the indoor light. If you think you have a "slow" lens, get up some speed by switching to this "fast" developer.

TABLE TOP SLIDE SHOWS

If you'd like to show slides to friends without setting up a projector and a screen and pulling down shades etc., we know what you need. . . . Port-A-View! It's a table-top self-contained slide projector with automatic slide changer and screen you use with the lights on. It's become a favorite 'cause it's so light to carry, so effective at showing slides. See Port-A-View at your dealer's counter today. It's only $54.95 and is the perfect way to show slides quickly.

LUCKY, LUCKY KIDS

Can you think of a better way to introduce our hobby to some youngster than with a complete darkroom kit? Wouldn't anyone love to get started in the fun of darkroom work with the right tools all at once?

That's why we're so enthusiastic about FR's new "Semi-Pro" Complete Developing and Printing Kit at only $12.50.

It features an all-metal contact print box and contains the famous easy-to-load adjustable FR developing tank, trays, thermometer, paper, chemicals, safelight, everything.

Such a kit would be a good Christmas gift, so reserve yours now at your photo dealer. He also has other FR kits from $8.95 to $29.95.

MORE $5 BONUS CHECKS

Send in your published photos with captions in print carrying credit lines for any FR product including Minolta Cameras. We'll send you $5.00!

FREE FAMOUS "LITTLE MAN"

Get this darkroom aid. Write in for your free LITTLE MAN "Glows-in-the-dark" light-pull to the **FR CORPORATION, 951-P Brook Avenue, New York 51, New York.**

Winner of first prize in the color division is Daniel R. Rubin, a magazine photographer, for his informal portrait of *Barbara* (*page 115*). Rubin's interest in photography began while he was a child, and when he entered high school he started serious study of the subject. He attended the Rochester Institute of Technology, studied art at Queens College, N. Y., and at a number of small art classes, and was a photographer during his Army service. He has been a photograph editor, also. His work has appeared in POPULAR PHOTOGRAPHY and various other publications. Rubin expresses his artistic talent also in painting—both oils and water color—designing and fashioning jewelry, and some work in ceramics; he has illustrated a book on the latter subject. He is a native New Yorker, now has his own studio in New York City, and he and his wife live in nearby Elmhurst, L. I. One of his black-and-white photographs was awarded a prize in this year's contest.

Rubin

Walter Chandoha, whose picture of a *Sydney Silky Terrier (cover and page 116)* was awarded second prize in the color division, is a free-lance photographer who specializes in canine and feline photography, and is the author and illustrator of photographic books on each subject. His work has been published in POPULAR PHOTOGRAPHY and many other magazines, as well as in newspapers, exhibits, booklets and on calendars, and he has won several photographic awards and honors, including prizes in earlier POPULAR PHOTOGRAPHY Picture Contests. Chandoha attended New York University's School of Commerce, and was a Signal Corps photographer in the Pacific area during the war. He was born in Bayonne, N. J., and now, with his wife and three small children, lives in Huntington, Long Island. Another of Chandoha's color shots and several of his black-and-white photographs are among this year's winners.

Chandoha

Third prize in color went to Joe Clark, of Detroit, Michigan, for his photograph of participants in a *Fox Hunt*, pictured in silhouette against an evening sky (*page 116*). Clark has won prizes in several earlier POPULAR PHOTOGRAPHY Picture Contests, and his work has appeared in POPULAR PHOTOGRAPHY and a wide variety of other publications. He is a native of Tennessee, and, with his wife and son, now resides in Detroit, where he has his own studio. Two of Clark's black-and-white photographs placed as winners this year.

Clark

His provocative depiction of this lovely *Model* (*page 117-118*) won fourth prize in the color division for Joseph H.

(*Continued on page* 197)

How to get very, very good pictures!

Your camera has a quality lens, one that gives you sharpest detail from edge to edge — even with the largest aperture.

Your camera has a direct view optical finder with an unusually large image — when you see better, you are bound to get better results.

Your camera has automatic film transport that allows you to work fast and, at the same time, gives picture protection.

Your camera is made by the world's oldest camera manufacturer—Voigtlander — since 1756, the best in lenses, cameras and accessories.

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35mm FOLDING CAMERA

It's Voigtlander's newest contribution to photography — something they've been doing better than anybody else since the first permanent photograph was made. The features of expensive cameras — styled "like a million" — but priced for the great American mass market. Voigtlander's Color-Skopar f/3.5 color-corrected lens, one of the world's finest, completely protected when not in use. Automatic film transport —— double exposure prevention "pop-up" film rewind — built-in flash — new, larger, direct view optical finder — simplified far or near "zone" focusing — *in fact, everything about this camera has been designed to get you better pictures, much easier, and at the lowest possible price!* Don't lose a minute — see the new VITO IIa, or get more information about it without delay.

Voigtländer
because the lens is so good

Voigtlander VITO IIa 35mm Folding Camera, with Color-Skopar f/3.5 Lens, Prontor SVS Shutter with Speeds from 1 second to 1/300th, and M-X Synchronization. Only **54.50**

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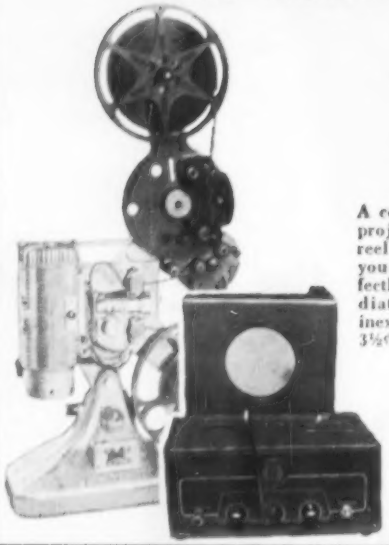

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This professional CINESONE SOUND OUTFIT is a complete magnetic sound recording outfit that converts virtually every 8mm or 16mm silent projector to sound—*for both recording and projection.*

A complete recording head snaps onto your projector just like any 300 foot, or larger, film reel. You record on any sound-striped film as you project the film—playing back the perfectly synchronized sound and picture immediately. Your local store can quickly and inexpensively sound-stripe your film (2½ to 3½¢ a foot).

Professionals everywhere have found CINESONE fidelity as good as far more expensive sound units. Your friends and family will be amazed at the truly professional quality sound films you can make with the new CINESONE. We believe that it is the finest unit of its type on the market.

This complete CINESONE sound outfit is nationally advertised at $199.75, but Penn brings it to you for the amazing low price of $99.50.

CINESONE MODEL C—including recording head adapter, complete amplifier, extension speaker, microphone and carrying case...Reg. $199.75...$99.50 at Penn.

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Illustrated circular on request. Either CINESONE outfit may be purchased with time payments. Inquiries invited. If you don't own a projector, write for Penn's combination price for the CINESONE outfit plus any projector of your choice.

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2 x 2 Slide Projector
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• Special 3" ctd. lens for wide angle projection fills a 50 x 50" screen at a 9 foot distance.
• 300 watt • All metal
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• Holds 300 cardboard or 150 glass slides
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with double bayonet lens mount to take Rollei accessories

• f3.5 ctd. lens
• 1 to 1/500 sec. and B
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Daylight Processing Tank

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Save $27.50! Brand New!
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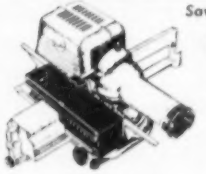

2 x 2 Slide Projector with Change-O-Matic

Reg. $67

• 300 watt
• Motor fan cooled
• 5" Luxtar ctd. lens
• Takes all 2 x 2 slides in any type mount or binder, *intermixed.*

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FREE! 2 sets of metal reels & cans with

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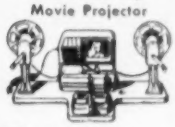
and Table Top Movie Projector



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- 2¼ x 3¼ screen with glass prism shutter

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2¼ x 2¼ Twin lens focusing reflex

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- Speeds from 1 sec. to 1/300 sec. & B.
- Automatic film transport crank and frame counter
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Eye-level prism finder for above.$14.95

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Enlarging Meter

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#828	1.85	1.45
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Specify Dulite or Indoor
Sold only in lots of 3 or more
Prices are per each roll or mag.

High Speed ASA 32 **EKTACHROME**

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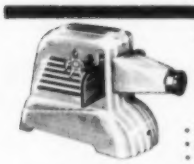

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- 300 Watt
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- Also takes 2 x 2 slides

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For movies and stills, artificial and daylight photography.

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TRIPOD SCREENS

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FREE! Plastic Dust-cover with each tripod

40 x 40" $9.55
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ROTO DRYER

- 12 x 29"
- Automatic squeegee
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Magnifies enlarger image for more critical focusing

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ANSCO Color Cut Film

- Early 1955 Dating—Fully guaranteed
- Daylight or Tungsten (specify)

Box of 10 sheets.... $2.49
5 boxes for $10.00

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New Performance Guaranteed!

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Case for Norwood or Sixtomat		2.25
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Standard Double

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Fits all Graphics and other cameras with standard press-type spring backs.

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2¼ x 3¼	$3.85	$2.79
3¼ x 4¼	3.99	2.89
4 x 5	4.12	2.99
5 x 7	4.71	3.39

Minimum Order—3 holders

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- All lenses coated
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- Pre-set diaphragms
- Latest models

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ZEISS IKON IKOFLEX 1A

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Like New! List 76.00 **57.00**

2¼x2¼ Roll Film. Automatic Film Winding, Prontor SV-XM Synchro Shutter, Speeds to 1/300, Built-In Magnifier and Eye Level Sports Finder, Double Safety Locking.

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All Binoculars Complete with Carrying Case

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35mm SINGLE LENS REFLEX CAMERAS

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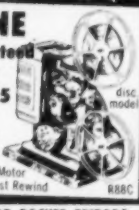

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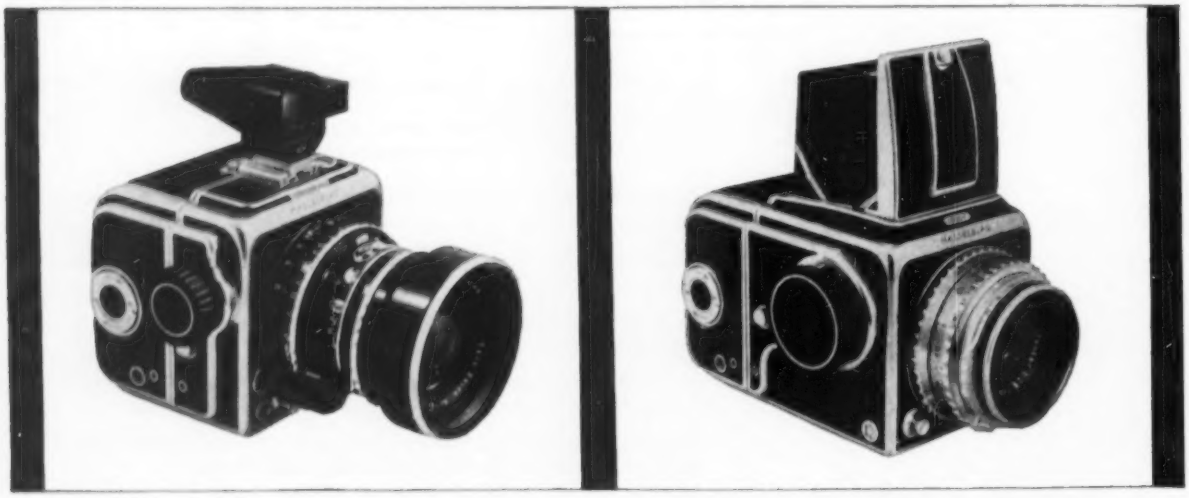

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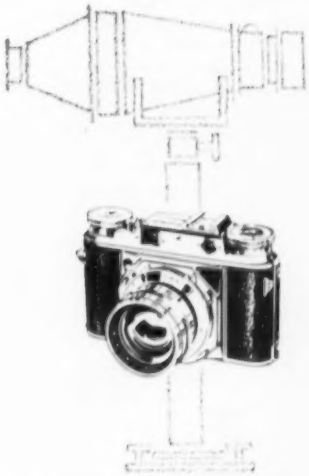

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candid shots by the Editors

Winners from Everywhere

At the risk of sounding like a colonial power, we can say that the sun never sets on the winners of our International Picture Contest. Seventy-five prizes this year went beyond U.S. borders, not only to "big powers" like Italy, Canada, and Japan, but to places like Borneo, Malaya, and Kuwait. Here's the box score on foreign prize winners, by country: Japan leads, as it did in 1953, with 21 (including the first prize of $2,000); Italy, last year's topper, took 14 this time; The Netherlands had seven winners; Canada and Switzerland five each; Sweden, Argentina, and France three each; Austria, Guatemala, and Hong Kong two each; and the following had one prize winner apiece: Brazil, British North Borneo, Great Britain, India, Kuwait, Luxembourg, Malaya, and Trieste. This year, for the first time in the history of the Contest, duplicate prizes were awarded because the judges felt two pictures deserved equal ranking; two people won fifth prize in the black-and-white division. You'll find a lot of the prize pictures reproduced in this issue, and a list of all winners at the back of the book.

Our Annual Makes the Post

As if in support of our contention that *everybody* sees *Photography Annual*, a copy of last year's edition popped up in a rather unlikely place: an illustration for a fiction story in *The Saturday Evening Post*. The story centered around a photographer, and artist George Hughes was alert enough to realize that a copy of the *Annual* would supply just the right touch. Here's a small reproduction of the picture—so small that you may have difficulty spotting the *Annual* in the lower right-hand corner. The illustration is reprinted by special permission of *The Saturday Evening Post*, and copyright 1955 by The Curtis Publishing Company.

The *Annual* in the *Post*.

Our Convention Coverage

An important part of our information-gathering function is done at meetings, conventions, and other gatherings of photographers and trade representatives. For this year's convention of the Photographers' Association of America, in Chicago, we designated Managing Editor Norman Lipton to represent us and report on proceedings. He did yeoman service in this respect, and you can read his dispatches in this issue's *Tools and Techniques* column. But the convention also made good use of Lipton's wide experience and background in photo products and equipment. He was called upon to conduct a session devoted to five-minute presentations by manufacturers and distributors of all the new products introduced at the trade show which was a convention feature.

Edgerton Gets PSA Award

Dr. Harold E. Edgerton, pioneer in the tools and techniques of electronic flash, received the 1955 PSA Progress Medal which is awarded annually for significant contributions to photography. The presentation was made during the convention of the PSA in Boston in early October.

Speaking of flash (electronic and otherwise), our January issue will be devoted entirely to flash, its equipment and its applications. A special eight-page supplement will deal with speedlight.

What They're Doing and Saying . . .

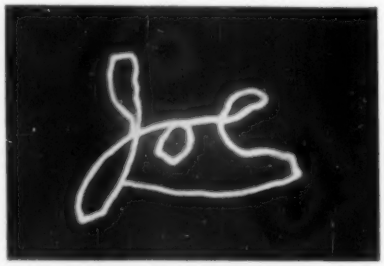
It's harder and harder these days to keep up with developments in photography. Last month in this space we reported to you that a Kodak official had predicted pictures by firefly-light within a few decades. Well, this month we've got to report that it's already been done! Says staff photographer Sam Dunton of the New York Zoological Society: "As part of a routine assignment to illustrate an article on fireflies, I produced some very fair negatives, using no other illumination than that given off by the firefly itself. This was acccomplished by placing the firefly on a glass plate over a convex reflector that collected the light and bounced it back past the firefly, thus producing a normal negative." To top it off nicely, Dunton reports that he used one of Kodak's own films, Super-XX.

•

Some time ago, at the request of the U. S. Information Agency, we arranged for an exhibition of some past winners in our International Picture Contests in Buenos Aires. According to word from an Agency official after the show, "the American contribution was superior in quality to that of the other countries. The prize photographs of American children in individual, unposed, realistic attitudes contrasted with "tourism" photos showing children of other countries in groups at play. . . . It was quite evident, even to the casual observer, that the photography of the American collection was outstanding."

Moonograms

Is there no end to what people can do with moonlight? Two months ago we ran a color feature called *Moon Pictures*. Last month, in this space, we followed up with an outdoor time-exposure portrait of a pretty girl made with nothing but moonshine. This month? Well, we've got a communication from Joseph Zderad of Westchester, Ill., who tells about his own adventures with the moon. Admiring the cold orb one night, he remembered that he had an unfinished roll of film in his Contessa, and he wanted to kill it. So he set the aperture at its maximum, f/2.8, focused on infinity, and took a bead on the moon, moving it so that the light pattern would spell "Joe" on his film.



Zderad's moonogram.

This was the beginning of a good deal of mooning for Zderad. In case you'd like to try it, he recommends writing the desired word on a small piece of transparent paper or film and placing this in the viewfinder as a guide for your celestial calligraphy A larger camera would make things easier, too, by furnishing a larger writing area. To discontinue the image for dotting "i" and crossing "t," just cap the lens with your hand for a moment.

In High School? Win A Prize!

If you're an American high-school student with a camera, there's prize money waiting for you in our special contest—the one that eliminates all competition except other high-scholars. Top award is worth $1,000, which will buy a lot of college education (or a lot of photo equipment, depending on how you look at it). If you saw the initial announcement of the contest last month, maybe you're already working on your entry. If you didn't, or if you haven't done anything about it yet, look for the announcement and rules on page 209 of this issue. And get those pictures in!

You get seven different speeds

With Bolex cameras you shoot movies at speeds from ultra-slow to extra-fast – 8 to 64 frames-per-second. Bolex 8 mm cameras are ideal for sports and action films.

You'll use an optical zoom viewfinder

On the Bolex an optical viewfinder uses moving lenses to show precisely what you are filming. No calculations or use of masks, no lines on finder – you shoot what you see.

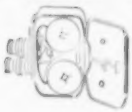
Instant stop protects your films

Bolex cameras stop instantly on rundown. With Bolex, film transport speed is perfectly even right up to the last frame – no change of speed to spoil film exposure or movement.

You can shoot single frames

Bolex comes with single frame device – and with a cable release. You can shoot titles, animation, cartoons, and scientific movies with the Bolex B-8 and C-8.

You'll like the easy loading

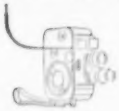


Bolex B-8 and C-8 (identical except for turrets) load with greater ease than a box camera. Drop in loading can be done even with gloves on; precision gate removes for cleaning in a flash.

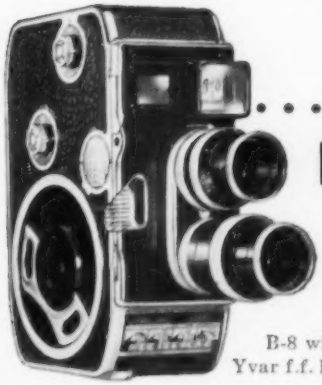
Swiss craftsmanship gives better films

Bolex cameras are made in the heart of the Swiss watchmaking country by Paillard. Bolex cameras have built-in quality giving steady, brilliant films.

You know you have extras, too



With Bolex, you get extras: genuine Morocco leather covering, ratchet winding, leather wrist-strap, near-the-eye geared footage counter, D mount, plus many other features.



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Out of your darkroom, combining utility with originality and beauty:

Photo gifts

you can make

By JOSEPHINE VON MIKLOS

Photography is more than just making pictures and here are six pages to prove it. Using it as an art medium, its possibilities for producing gifts, only a few of which are suggested here, are endless. Here is photography enhancing and dramatizing the tools of daily living; producing design for new effects, new beauty, new uses. You can take your own kind of picture and put it to work for you.

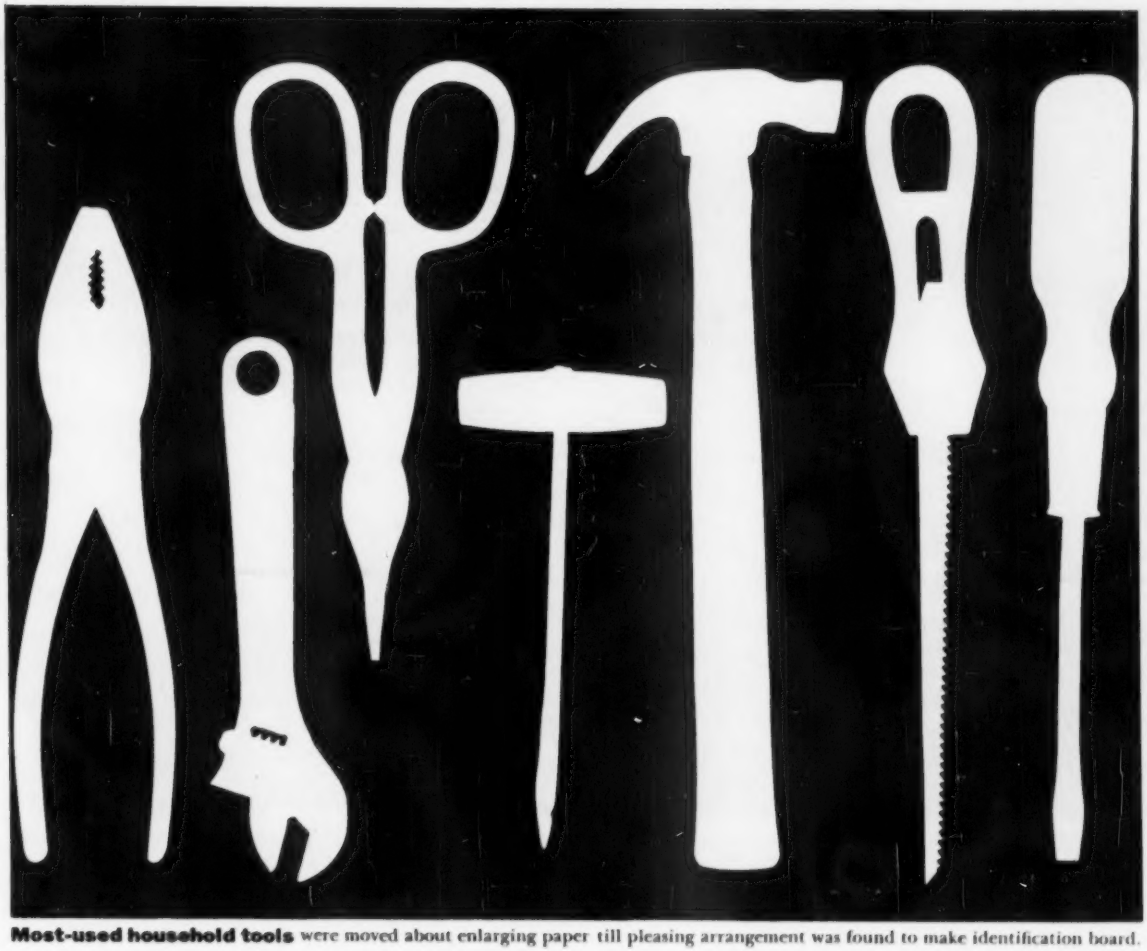
Several applications of the photogram technique, a simple and versatile method of producing a picture in silhouette using only light and ordinary printing paper, are shown on this and each of the following two spreads. Using Adlux paper, you'll find further possibilities in the creation of lamp shades, screens, table tops, decorative windows, or anything requiring translucency.

All other gift ideas suggested incorporate the idea of covering various-sized and -shaped containers with photographs of their contents. This idea can, of course, be applied to many things; a thousand and one ordinary but necessary household or shop items can be photographed in interesting and imaginative ways and the photograph then is used as a covering to identify containers made from old coffee cans, boxes, jars, etc.

Keep in mind that good design must make good sense. The more appropriate the choice of picture and the simpler its form, the more likely the gift will be lasting.

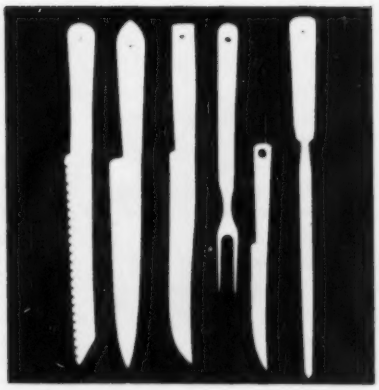
Identification boards for housewares,

HERE is a darkroom technique, requiring no camera, that can be put to work in endless ways. The photograms on the opposite page were turned into useful identification boards by mounting and hanging them. Make them yourself by first getting a visually pleasing arrangement of your pieces on a sheet of enlarging paper, placed in the easel; then giving the paper full exposure by white light to get the solid white shapes these objects make when they intercept the light. Develop and fix the print in the usual way. See other gift-making ideas on following pages. See also *New Ways with Photograms*, in our September 1955 issue.



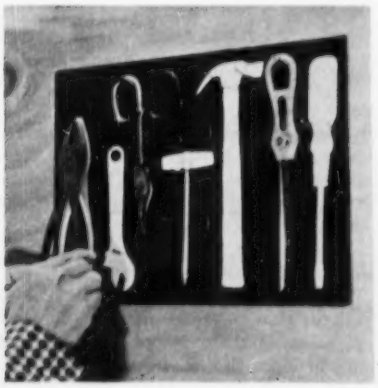
Most-used household tools were moved about enlarging paper till pleasing arrangement was found to make identification board.

tools, made by photogram technique, help put a kitchen or workshop in order



Kitchen utensil outlines on photogram produce decorative, useful hanging board.

Holes in utensil handles leave black dot during exposure, showing nail placement.



Tools used to make photogram are shown hanging in proper places on mounted print.

Decoration is combined with easy identification in these pantry containers covered

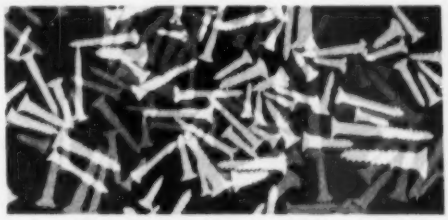
No need to guess what's kept in the containers shown on these pages. Photographically speaking, their exteriors tell you at a glance. This not only helps a busy housewife or handy man-about-the-house who are constantly grabbing for the various tools of their trade in kitchen or workshop; it also adds a bright, pleasant note and a visual feeling of efficiency that helps make working a pleasure.

The cannisters are, of course, former coffee tins with a new coat of enamel. You can apply the same idea to other household staples that need to be housed in containers to maintain order—pins and needles, nuts and bolts, and so on.

All shots on these pages were made by the light of one photoflood, placed off to the side of the subject matter to emphasize its form and texture. Use of a tripod is an obvious must to obtain the sharpness that will insure easy recognition of your subject; otherwise your entire purpose is defeated. Exposure, on Super Pan Press film, was for 1/10 sec at *f*/22. Prints are cut to fit area to be covered; or a small print can be used merely as an identifying label. Coat both can surface and print back thoroughly with rubber cement; let stand a moment. Then press down firmly with sliding motion. Since the containers must endure considerable handling, it's a good idea to protect the print covering with a plastic fixative (comes in matte or glossy finish) that can be sprayed on.

Circle of print is cut to fit lid of container and affixed with rubber cement.

Beans' portrait (above) is being made with light from one photoflood placed off at side to point up subject's shape and texture to make it completely recognizable. Right, shots of other pantry staples: sugar, flour, tea bags.



Photogram technique lends itself easily to making of contents-revealing covering in infinite variety of patterns. Objects used at left—screws, nuts, and bolts—were moved several times during exposure, adding grays to blacks, whites.

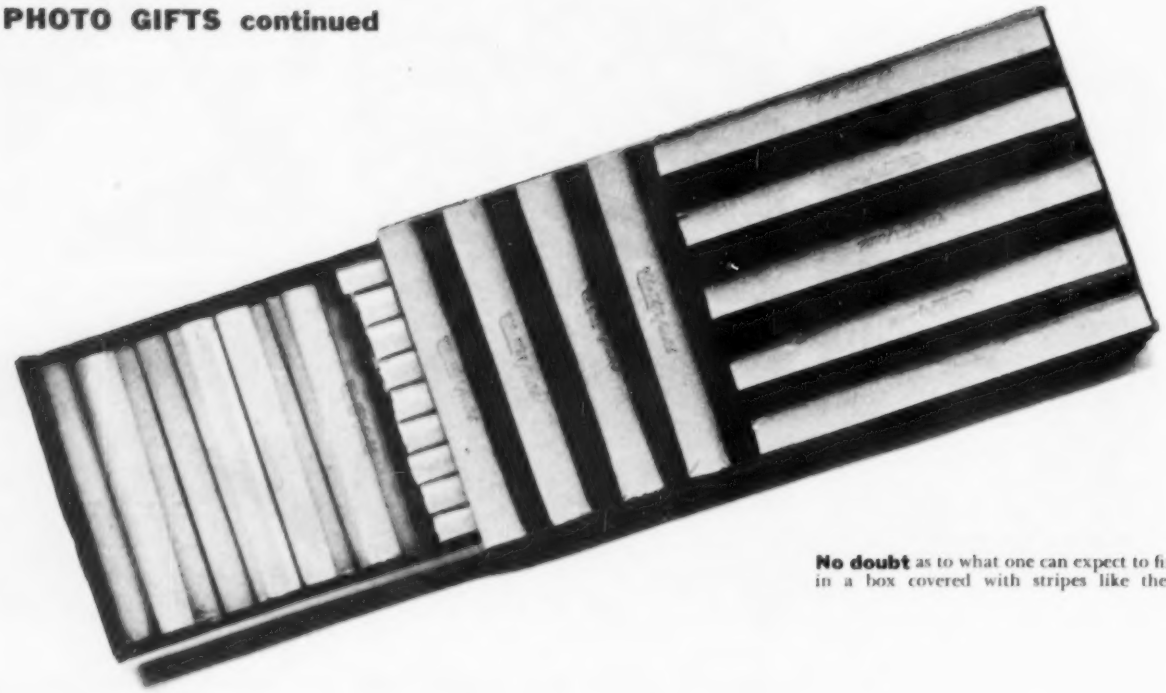
with photographs. A set of four is a perfect household gift for you to make

Sides of container are next coated thoroughly with cement; let stand a moment.

Rectangle, cut out of same print and equal in area to can's sides, is cement-coated.

Print rectangle is pressed down firmly onto can with sliding motion till it adheres.

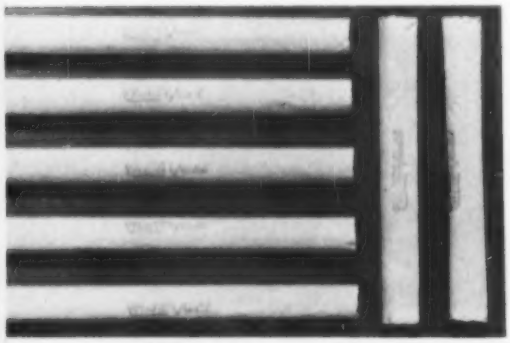
continued



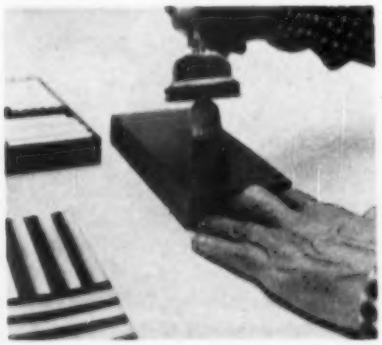
No doubt as to what one can expect to find in a box covered with stripes like these.

Photographically decorated accessories add a bright accent to any interior

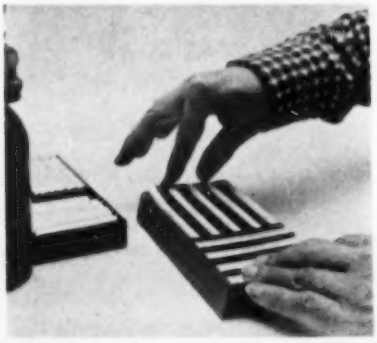
Here's a gift idea that will spark any setting and make for conversation for Christmases to come. You needn't limit its application to cigarette boxes; containers for candy, matches, pencils, games, playing cards, etc., will be prominently and proudly displayed by a grateful recipient. If you don't have a cardboard box of appropriate size, you can easily make one to your exact specifications, painting all but the top a dark or neutral color. Work out an arrangement of your subject matter beforehand. The cigarette shots were taken with a Rolleiflex on tripod in natural light, supplemented with one photoflood. Exposure was for 1/10 second at f/32. Print may be coated with a spray-on plastic fixative for protection. Coat print back, box top with rubber cement and press together.



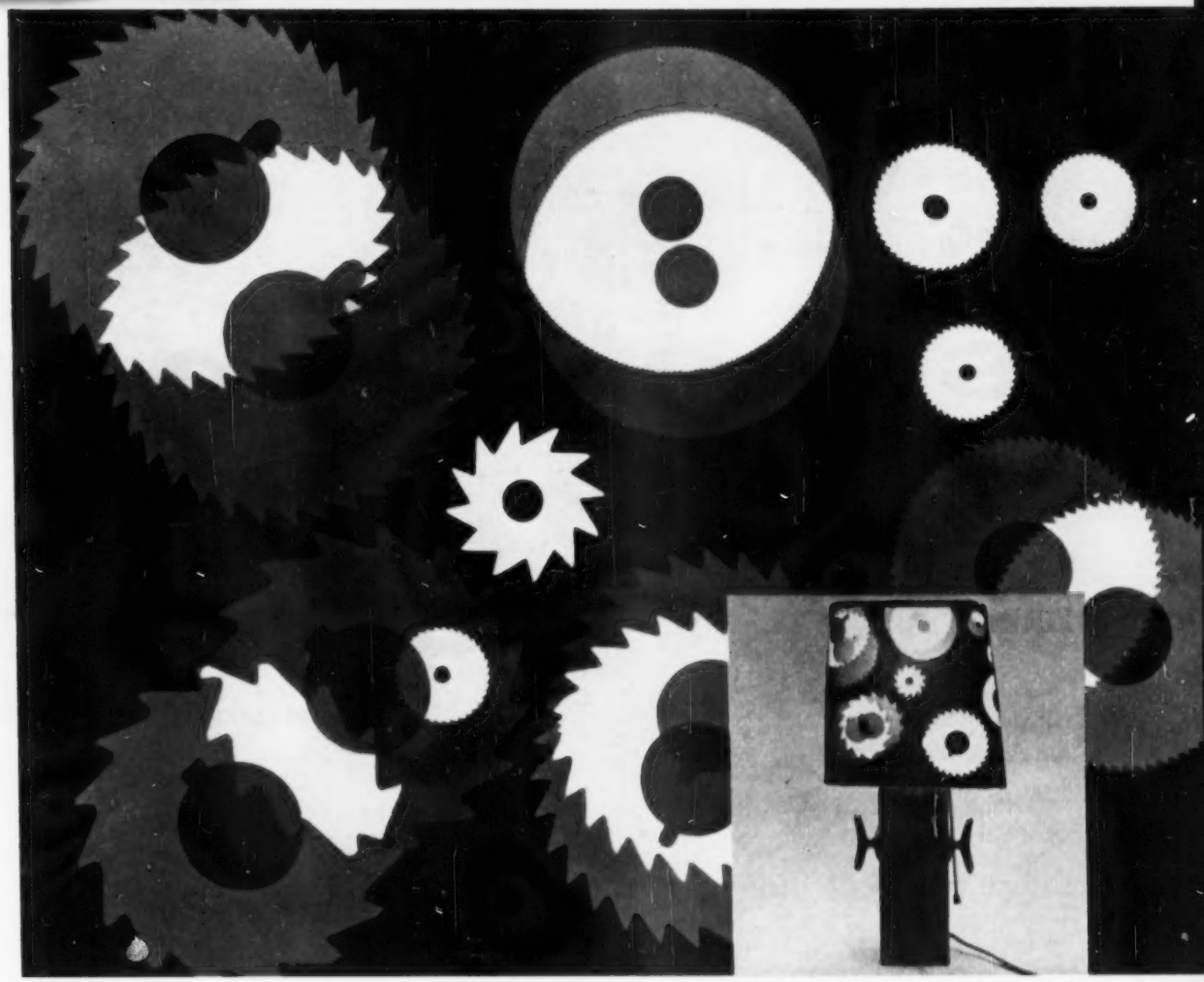
Cigarettes were lined up, shot with sidelighting from flood to emphasize form.



Box top is coated thoroughly with rubber cement and allowed to stand a moment.



Back of print cover is coated with cement and pressed onto box with firm, even motion.



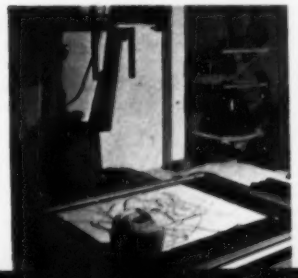
Milling cutters were used to make interesting abstract design for shade, above. Translucent Adlux printing paper was used.

Photograms at work again, this time as lamp shades

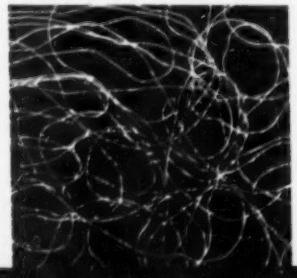
Unlikely, offbeat objects can be used to create unusual photograms for a practical application: lamp shades. If you *think* you have no subject possibilities at home, then your fun is just beginning. Milling cutters were used above; some were moved once during exposure to get interesting double images and to add a third tone: gray. Same technique was used in making photogram with string, below, producing a variety of tones and shapes. Lamp shade above is 6 in. high; photogram prints, made on 8x10 Adlux paper, were taped together to make complete shade, trimmed where necessary for fit. Black plastic electrical tape binds top and bottom edges of shade for a professional finishing touch. The translucent Adlux paper may be obtained from most photographic dealers.

Photogram print is trimmed to fit shade. Use as many as necessary.

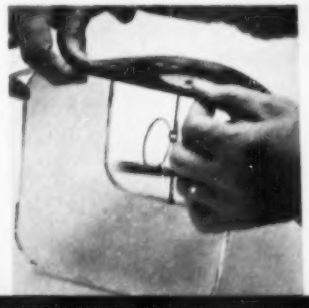
Photogram setup: string is arranged in interesting pattern on enlarging paper in easel.



Resulting print of setup at left. Double exposure produced variety in tonal values.



Lamp-shade edges are bound with black plastic electrical tape.



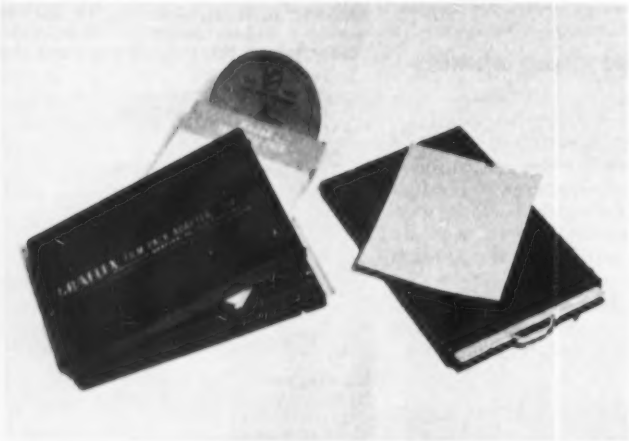
How to develop

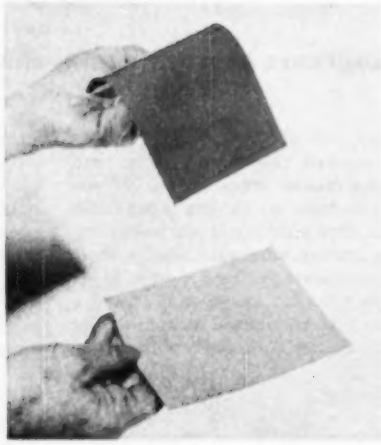
sheet film

and

film pack

By DAN BECKER





Differences between sheet film and film pack

Sheet films are darkroom-loaded two to a holder but a film pack holding 12 sheets of film is purchased ready for use (left). Higher cost of pack offsets weight and bulk of six loaded holders. Since pack film is pulled out of position after each exposure, the film base is more pliable than that of sheet film (right).

THE film materials used for general photography are broadly classified in two categories—35-mm and roll films on one hand and large films on the other. Of the first, the processing of *roll film* was covered exhaustively in the April 1955 issue of POPULAR PHOTOGRAPHY. This article deals with the two forms of large film available today—*sheet film* and *film pack*.

Before George Eastman's successful introduction of flexible roll film, in 1888, the photographer had no choice. As 35-mm photography was yet to be born, not only were large film sizes necessary, but such materials as the sensitized metal plate and the glass plate were the common film bases. Eastman's success has relegated these types to the province of the scientific specialist and eventually supplanted all others so that today even large camera users employ the same flexible-base films as do roll-film cameramen. Therefore, it becomes clear that sheet film and film pack differ from roll film, not so much in what goes into their make-up, but rather, in their handling, development, and the equipment used in processing them.

The greatest advantage of roll film is in its handling, since many pictures can be taken on one roll. That same roll can be loaded or removed from the camera anywhere, at any time, making possible an unlimited number of pictures at low cost and without extra equipment. In contrast, sheet films are separate sheets, generally used one to a picture, which require some additional equipment to fit them into the camera. Sheet-film holders, accommodating just two sheets per holder, or the more-expensive sheet-film magazine, which is loaded by the photographer with one dozen pieces, must be used. The film is loaded or unloaded from these adapters in the safety of the darkroom, limiting the number of pictures possible at one session to the degree of investment in these accessories. Also, in processing the film after exposure each separate sheet must be handled, not once, but many times, with increased need for care.

Film pack answers the demand for a lightproof magazine that is changeable in ordinary light conditions and reduces the needed investment in accessories. Just one film-pack holder is used, but handling it requires familiarity and patience. In processing, film pack is awkward to work with unless the routine has become second nature. The weight of the film base is no heavier than that used with roll film (much more flexible than sheet film, especially when wet), and disassembling a film pack containing a dozen pieces of film, plus as many separator sheets of paper, can seem like a Rube Goldberg nightmare to the novice.

All black-and-white film development is basically the same, regardless of size,

but different size groups demand different processing times. For example, 35-mm film usually requires more developing time than any other. This is the result of the manufacturer's effort to give the photographer the best grain pattern possible for so small a negative. The medium-sized roll films are somewhat faster in their own developing agents, with the sheet and film-pack types being developed fastest, as a general rule.

When sheet and film pack are being processed time differences are short enough to be of real concern to the worker. Where normal roll film may take 16 minutes and 35-mm as much as 20 minutes, the larger sizes will develop fully in five minutes or less (there are exceptions to the rule in all types). This means that the routine of handling these large films must be smooth, well rehearsed, and motion-saving to yield good results in the short time allowed. Frequent or constant agitation of the film during development is necessary to prevent mottling or streaking of the image and to eliminate "pinhole-itis."

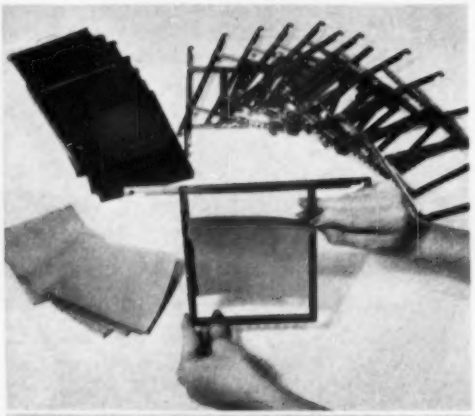
Some professional photographers who work exclusively in the larger sizes claim that this short developing time produces another result of which they do not approve. They say that well-exposed negatives become too contrasty for normal grades of paper when they are printed in condenser-type enlargers. To counter this effect, they never process important work in fresh developer, but exhaust it beforehand by developing exposed waste film—or less important work—until the preparation has completed about three fourths of its normal life span. (Total exhaustion of most sheet-film developers is reached, generally, when one 4x5 sheet per ounce of stock solution has been developed.) Then, after computation of the suggested time increase, negatives put through it will yield images of normal density with less contrast range which print more easily with a more gentle tonal gradation.

Equipment for Processing

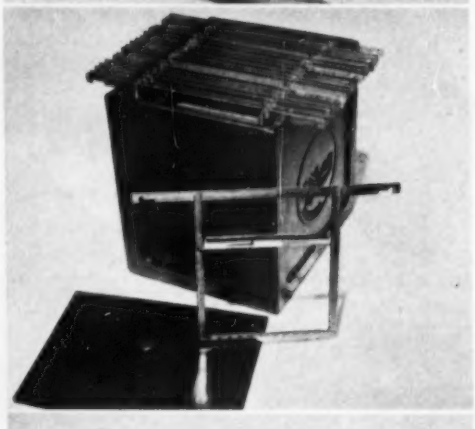
The processing equipment for large negative sizes is different than for roll film in that the film is not wound around spools in most tanks on the market. Because of the heavier sheet-film base they can be "stacked" on end, in a box-like tank, almost the way dishes are stacked on a drainage rack. The *Nikor* sheet and film pack adjustable tank is an exception and is popular because of its economy in solutions and other features.

At least 40 different sheet-film and/or film-pack tanks are made by more than half that number of manufacturers. Some are fashioned of plastic, some of stainless steel, (*Continued on page* 158)

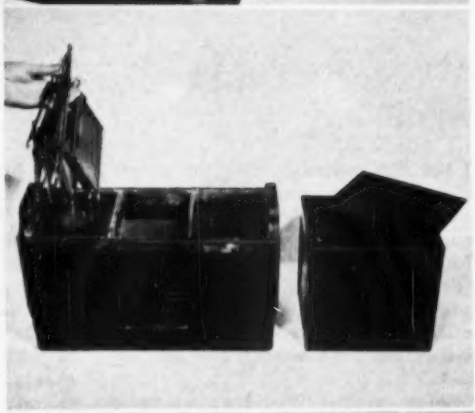
Open tanks can be used for dark-room processing of sheet films



Films are removed from holders in dark room, stacked emulsion side up, and inserted into hangers holding one sheet. Handling only by edges avoids fingerprints.



Hangers are hung in tank containing developer. To eliminate draining solutions use several tanks and move hangers to succeeding tanks as the processing proceeds.



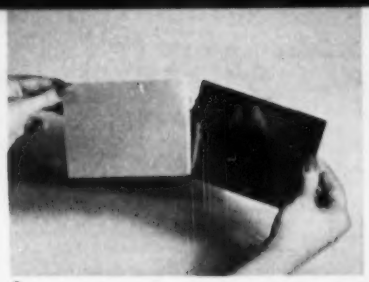
Agitate by raising and lowering hangers. Allow a few seconds for liquid to run off. A three-section tank permits moving the hangers along with each processing step.

After films are washed and hung in clips for drying, hangers are washed well and hung in an open carton for drying. Hangers can be left in carton for future use.

Both film types can be processed in daylight tanks

1 Film pack consisting of films attached to tabs and separator sheets enclosed in light-proof magazine is disassembled in darkroom and films removed. **2** Separators are torn off by hand or **3** cut off not more than four at a time on a paper cutter. **4** Two types of darkroom loading tanks are available, plastic (slotted) and stainless steel (reel type). **5** Film is inserted gently in curved slots of plastic tank. **6** With films in place, tank is closed, light turned on, developer poured through top, and developing time begun. Agitate at intervals. After the films have been fixed they are washed in tank and removed to spring clips for drying. **7** Tank is taken apart, washed, and excess water shaken off. Let tank drain dry or use lintless towel.

1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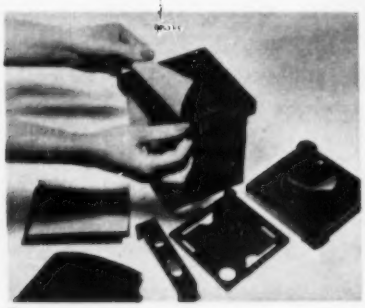
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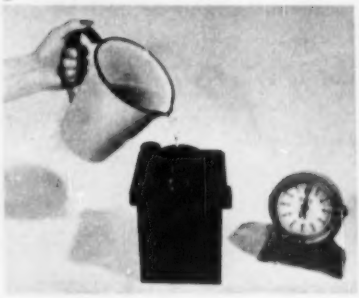
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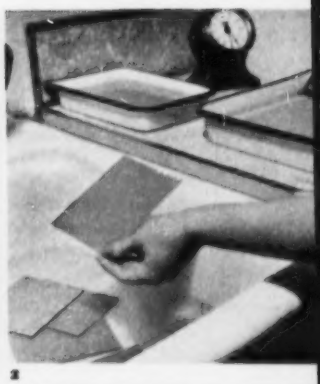
Developing in trays by inspection or time-and-temperature

1 Trays with solutions are arranged in order of usage. Sink is partially filled with water. **2** With lights out, films are presoaked in water to prevent sticking. **3** After allowing a few seconds for excess water to run off, insert films one at a time sidewise into the developer. When all are in, timer is turned on. **4** Inserting film corner first is incorrect as the sharp corner can scratch film beneath it. **5** Agitate by rotating film from bottom to top at 5-second intervals until full development is reached, either by inspection or time and temperature method. Allow films to drain before moving along to next tray at five second intervals, agitating in each solution.

1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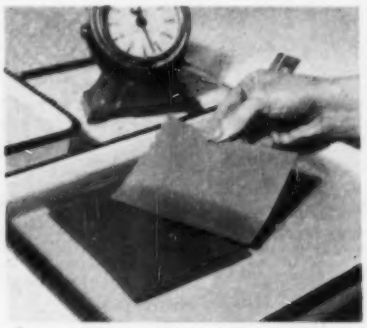
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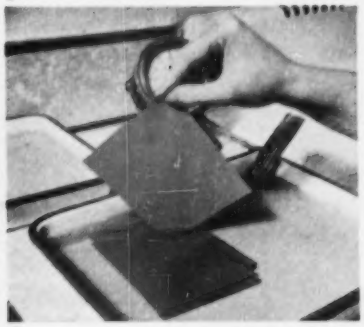
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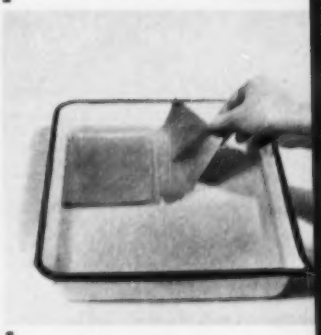
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GEORGE SILK

DOES IT THE HARD WAY

By LOU JACOBS, JR.
All photographs courtesy Life, *© Time, Inc.*

Typical of the kind of picture Silk gets—regardless of the conditions—is this one of pilots leaving planes in raging blizzard after a patrol flight over the polar area.

Persistence and tremendous energy carry this Life *photographer through the toughest assignments an editor can hand out*

ALL the tricky forces of nature have done their best to make it as tough as possible for George Silk in his 15 years as a photographer of the world scene. He has worked in Polar cold, corrosive heat, crippling fire, whipping winds, and in the man-made hazards of bullets and shrapnel. For the past 12 years as a *Life* staff photographer George has taken a lively delight in his personal struggle with the elements, and suffered no more than a few broken ribs, some tropical diseases, and a variety of shocks, scares, and awful surprises.

But George Silk is no self-acclaimed hero. He is an adventurous photojournalist with a singlemindedness that makes taking chances a normal part of his life.

Since 1943 Silk has filled the pages of *Life* with some of its most memorable stories. Remember a full-page shot of a young soldier wounded at Anzio holding his Purple Heart near his bloody bandages?

Vapor trails made by jet engines curve across the vast reaches of space at 30,000 feet; from one of Silk's most difficult stories, on Thule Air Force Base in Greenland.

In 112 F heat, 100% humidity, Silk managed to shoot one roll on rugged workers digging flooded tunnel in California mountains. Flash unit short-circuited frequently, film reticulated, and his Nikon was ruined by corrosive effects of the water!

Recall a sequence of a G.I. dying in front of your eyes, wiped out by the Germans as he rushed across a narrow Roer River foot bridge? Remember the two stories on an Air Force North Pole expedition, the solemn account of isolated missionaries in Labrador, the pathetic report of a Canadian town burned to the ground, or a glimpse of jets making vapor trails at 30,000 feet over Thule Air Force Base in Greenland? And more recently, a revolution in Guatemala, a boiling-hot tunnel being drilled into California hills, or a blizzard at Greenland's airport? All these are George Silk stories which place him where he belongs—in the top brackets of pictorial jour-

Soldiers almost murdered Silk in postwar China for photographing this begging boy and rice merchant's well-fed wife.

←

Island missionary bids farewell to an old trapper in the isolated Labrador peninsula region. Here the use of back-lighting helped to convey an intense feeling of loneliness.

Silk's working day is not always dangerous; here, on one of the more pleasant days, he shot a pair of energetic young movie stars—Terry Moore and Robert Wagner—romping in the surf.

nalism, a highly competitive field.

Strangely enough, George started a career as a farmer at the age of 13, when he left school near his home in Auckland, New Zealand, to work on a farm for a dollar a week and board. When he was 16 he was fired, but soon happened into a job clerking in a photographic supply store where he could take the camera stock home with him for weekend picture-taking. In a few years he was thoroughly familiar with 35-mm and twin-lens reflex equipment, and made some excellent action shots of his three favorite sports: motorcycling, skiing, and sailing. During this time George never studied photography; but he absorbed a knowledge of his tools while he was recording the life he most enjoyed.

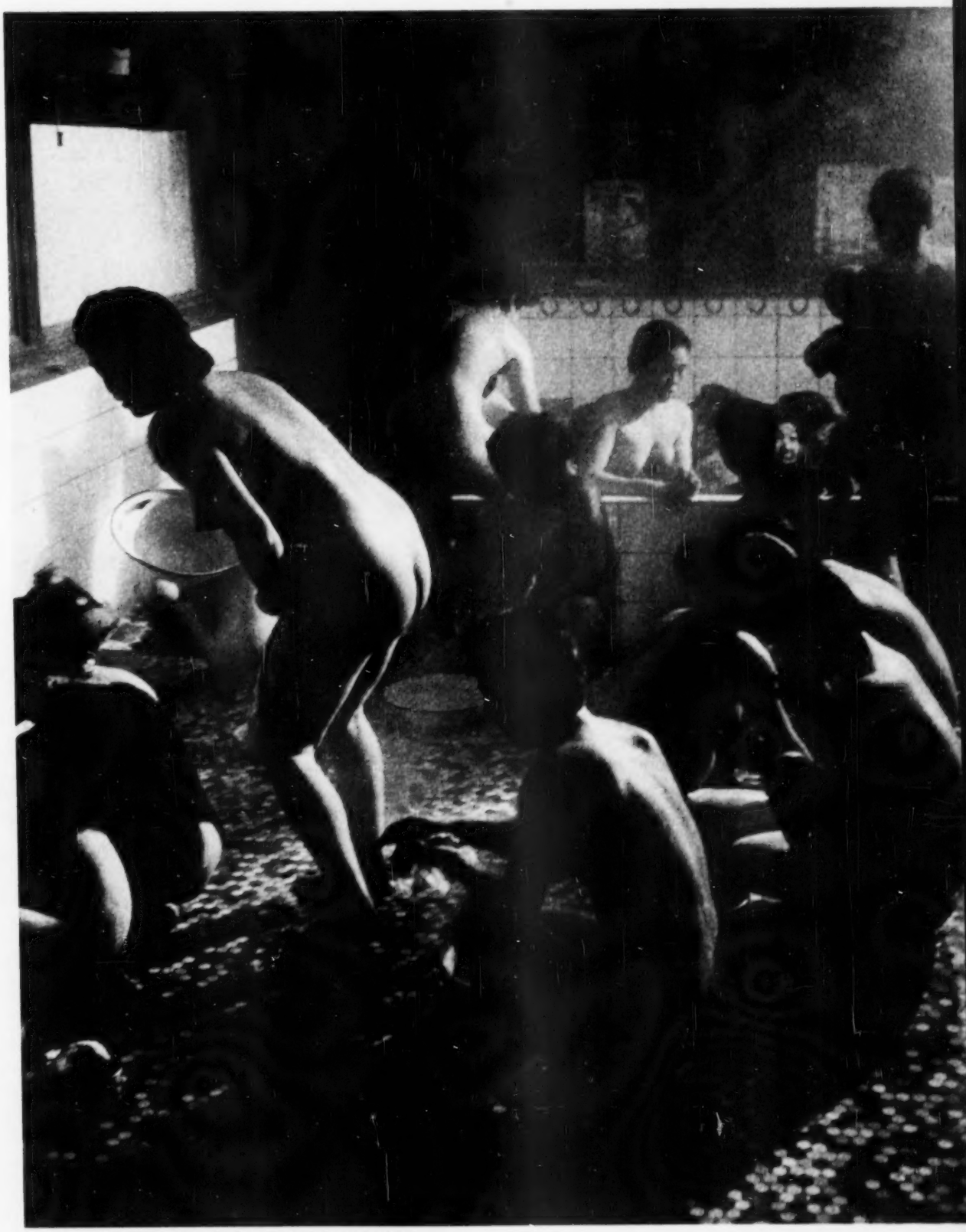
When war broke out in 1939 George decided that what he wanted most was to be a photographer of that war. He spent his meager savings to make the long trip from New Zealand to Sydney, Australia. He was 22 and very earnest. Just as the armed forces were swooping down to draft him, he walked into the government offices and asked to speak to Prime Minister Robert Menzies.

"They let me in," he says, still surprised about it today. He had brought a batch of his sports photographs and was himself a picture of conviction. "I explained that I was anxious to see that the Australian forces had a full pictorial record of their campaigns. The P.M. just listened as I made my eager pitch—and when I finished, told me to come back at 3:00 P.M.

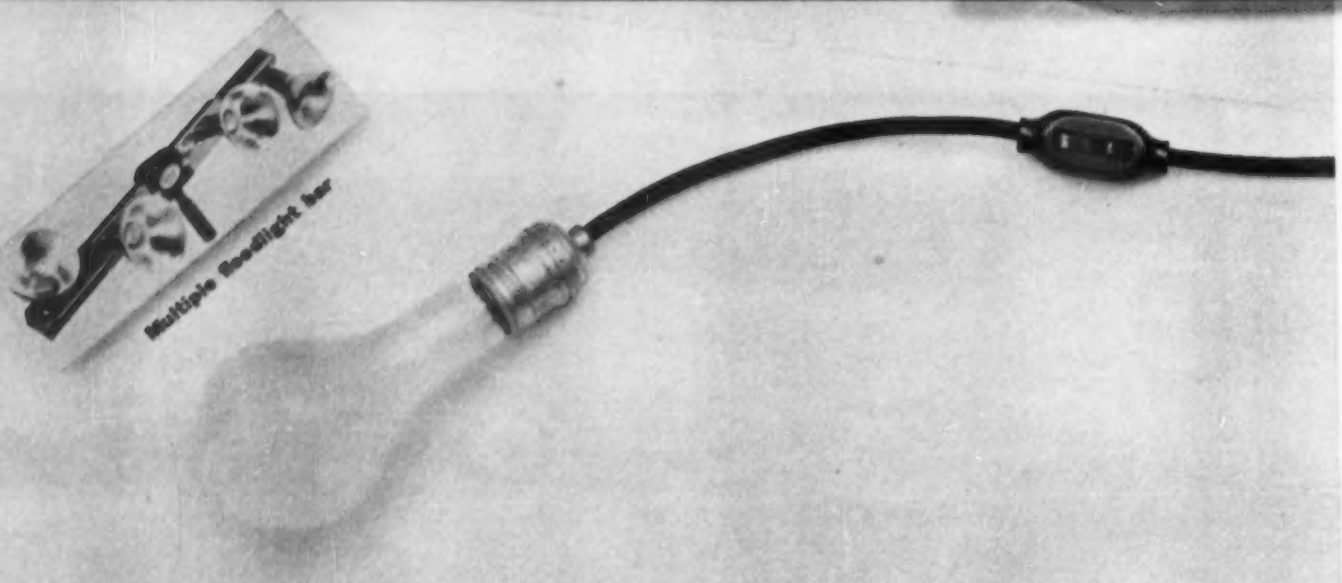
That afternoon George was accredited a full-fledged war correspondent and ordered to Melbourne the next (*Continued on page* 170)

In a 1949 story on New York's Latin Quarter night club, Silk showed singer Linda Lombard catching up on her mail backstage.

← *At the Democratic presidential nominating convention in 1952, alert Silk caught Adlai Stevenson—then a delegate—in a moment of extreme political indecision.*



A photo essay by Silk on the little village of Harada in postwar (1945) Japan included this photograph inside the one communal bath in the entire town.



what you need to know about

Electricity

By HARVEY SHAMAN

Photographs by the Author

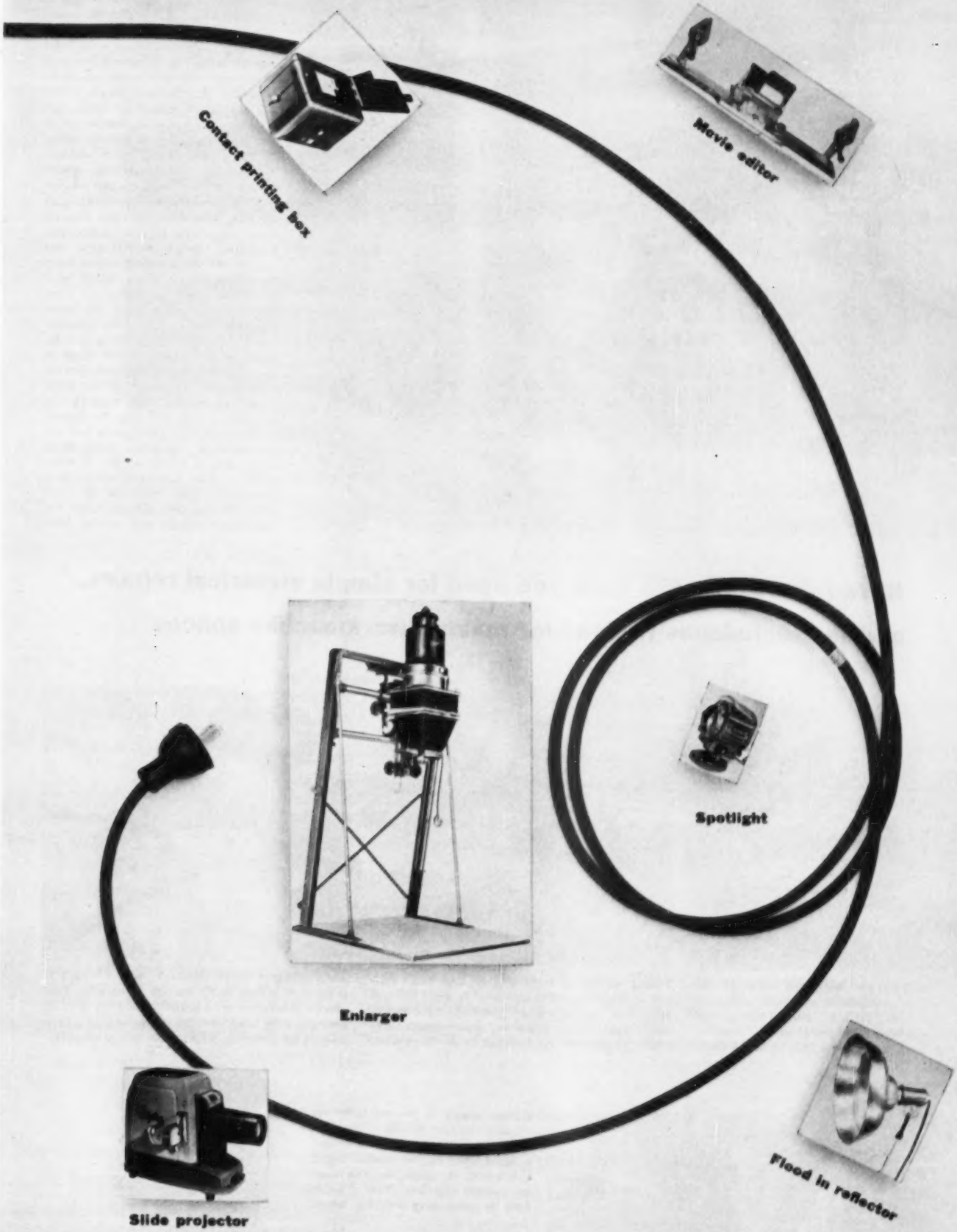
FOR your own safety, efficiency, and convenience, there is a lot you need to know about electricity in photography. It serves you in picture-taking, processing, and presentation of your photographs. You need to know what to expect of your equipment, your wiring, your household circuit, and what is safe to do with it, and what is dangerous. This is a concise and valuable outline of electricity for photographers.

The primary function of electric current in photography is to produce light—with floodlamps and spotlights, flashbulbs, enlargers, safelights, slide and motion-picture projectors. Its secondary functions are to produce heat (in print dryers and mounting presses), and motion (in exhaust fans and movie projectors).

Electric light is created in either an incandescent bulb or a fluorescent tube. In the incandescent type, a wire filament is heated in a vacuum by the current, and its glow makes the light. Such bulbs are used for ordinary household lighting, flood and spot lighting, and projection.

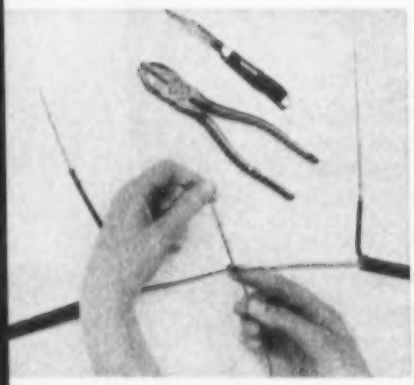
Fluorescent tubes are filled with a gas or dusted with a powder which glows when current passes through it. These tubes are commonly used in banks for simulated daylight in a studio, and in cold-light grids in some enlargers.

Each type of lamp is designed to do a particular job. A photoflood, for example, is similar in size and shape to an ordinary household bulb, but its filament is designed to offer extremely high *resistance*. (See the Glossary at the end of this article for this and other electrical terms.) This means that the lamp will give very much more light than the regular bulb, though for a much shorter time—about two to six hours. (*Continued on page* 158)

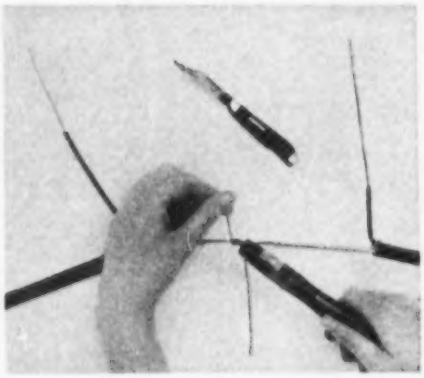

Contact printing box
Movie editor
Spotlight
Enlarger
Slide projector
Flood in reflector

EQUIPMENT AND SUPPLIES needed for basic electrical repairs, modifications: **1.** Flashlight—when blown fuses kill all lights, or for working in corners where room light doesn't reach. **2.** Soldering iron and rosin-core solder, for secure wire connections. **3.** Line-cord toggle switch for individual control of lights, appliances. **4.** Terminal female socket for flood, flash, and household bulbs. **5.** Male plug (flat type) to connect equipment to wall outlets, spider boxes. **6.** Fuses, vital for the prevention of fires caused by overloading of circuits. Keep only the right sizes on hand. **7.** Tape, for wire connection insulation. Fabric-base friction and the rubber types are illustrated here. **8.** Pliers, for twisting heavy wire in splices, and cutting wire. This square-nose type is good for most purposes. Tape on handle provides insulation and a better grip. **9.** Screwdrivers. The standard shape is most efficient, but the narrow-bladed one will be necessary where screw heads are recessed. **10.** Pocketknife, for slitting and trimming insulation; a most valuable and versatile tool for all electrical repairing. Keep these tools, and a spare supply of such items as fuses, tape, and solder, in a convenient place—perhaps in your darkroom—so you will be ready for emergency repairs and wiring jobs.

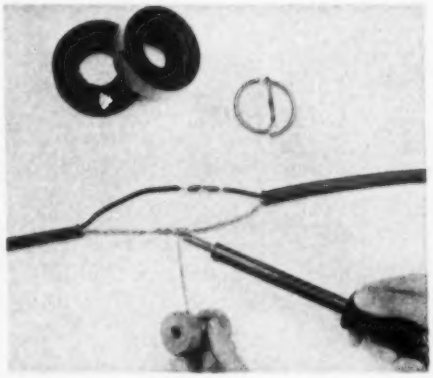
Here (above) are the tools you need for simple electrical repairs, and the techniques (below) for making workmanlike splices



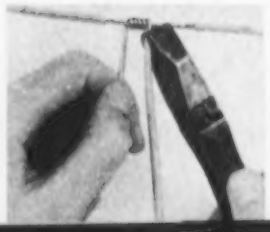
Splice begins with proper preparation of wire. Cut insulation from at least three inches, and scrape with knife; match wire colors; white to white, black to black.



Twist wires at right angles, and wrap each end around exposed shank of other wire. For stiff solid wire, you will need pliers to make secure and smooth twists. These are square-nosed wire-cutter pliers, ideal for heavy-duty material work.



Soldering is always desirable, and necessary if there is to be any strain on the connection. The proper procedure is to permit soldering iron to heat the wire, then melt small amount of solder directly on the joint. Avoid messy lumps of metal.



Other ways of joining wires are illustrated here. At left, a T-splice, with one wire twisted firmly around a bared spot in the other. Right, a Y-splice, in which the two ends are twisted together. This is often used in assembling junction boxes.

How much wattage is it safe to use?

Here are some typical safe combinations

On a general household circuit, designed to handle 1800 watts, you can safely use the following typical combinations of photographic equipment and domestic appliances:

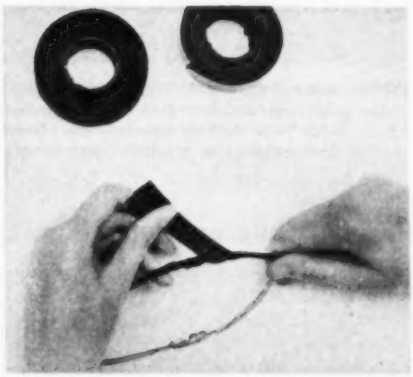
Refrigerator, television, four 75-watt lamps, two No. 2 floods	TOTAL, 1,750 watts.
Toaster, refrigerator, two 100-watt lamps, print dryer	TOTAL, 1,700 watts.
Hand iron, television, two No. 1 floods	TOTAL, 1,700 watts.

Average photographic equipment wattages	
No. 2 photoflood	500
No. 1 photoflood	250
Enlarger bulb*	75-500
Safelight*	10-30
Print dryer	300
Dry mounting press	300

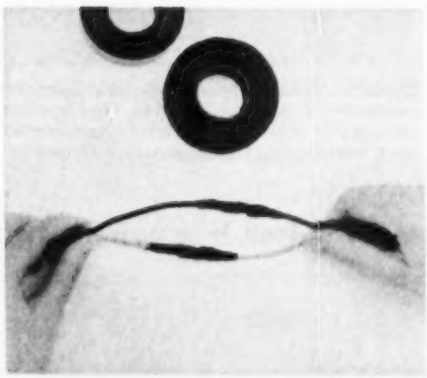
Average domestic appliances wattages	
Automatic toaster	1,050
Coffee maker*	up to 1,000
Television	200
Refrigerator	250
Hand iron	1,000
Vacuum cleaner	500
Lamp*	40-300

* Check appliance for exact wattage.

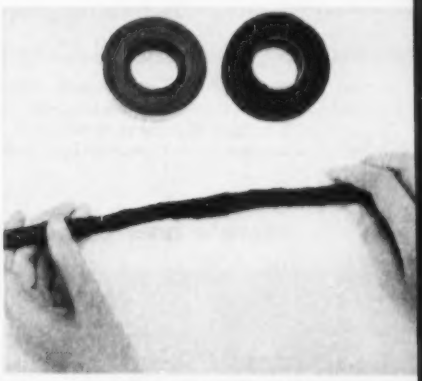
Most modern kitchens and utility rooms have "small appliance circuits" designed to carry up to 2,400 watts.



Tape both connections independently with rubber tape, starting at one end of the splice, working across, and spiral it back to the starting point. Friction tape (for other insulation) and slightly elastic rubber tape are shown here.



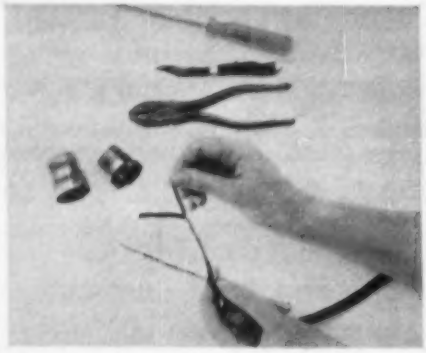
With both wires securely taped, job is ready for completion with friction tape. Note how the joints have been staggered so they do not bring thickest parts together. This helps avoid a lumpy splice, a potential cause of additional trouble.



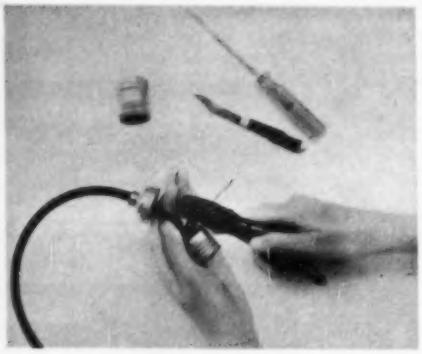
The completed job, with the two wires neatly bound together. Note that the splice is scarcely thicker than the double wire itself. This will be a flexible, trouble-free joint.

Here's how to attach a terminal socket to the end of a wire. This is the kind

Dismantle the socket by pressing on sides of body to release the crimped edge. Before going any further, put end cap of socket on cord.

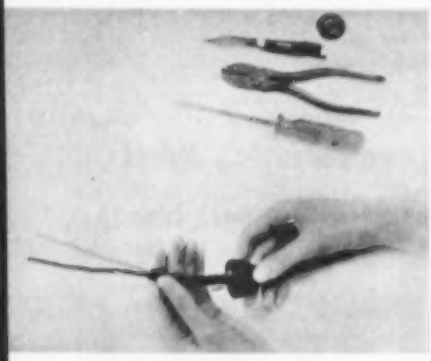


Strip insulation from the wire ends to a generous length (at least three inches). Scrape wire with a knife blade for sure contact. Tie an Underwriters' knot as in the pictures just below.

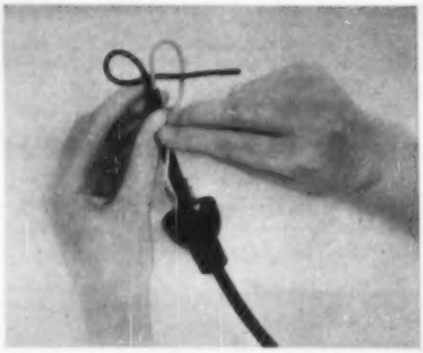


Wrap the wire ends around the terminal screws in a clockwise direction—the same way you will turn the screws to tighten them. Snip off wire tips with cutter pliers, to avoid short circuiting.

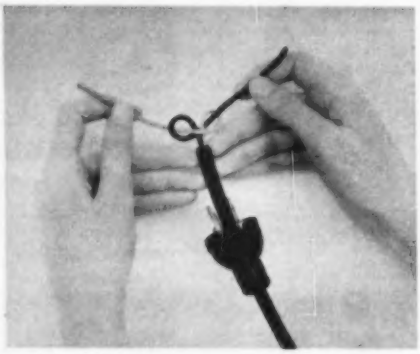
Here's how to attach a male plug to a power cord, and tie a Fire Underwriters'



This is the commonest of all electrical jobs, and one of the easiest. To begin, slip the plug on the cord as shown, strip outer insulation.

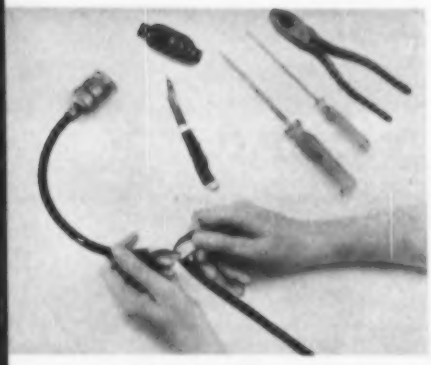


Underwriters' knot is more easily demonstrated in pictures than described. First loop one wire to pass behind both. Then bring the other wire behind the projecting tip, and forward.

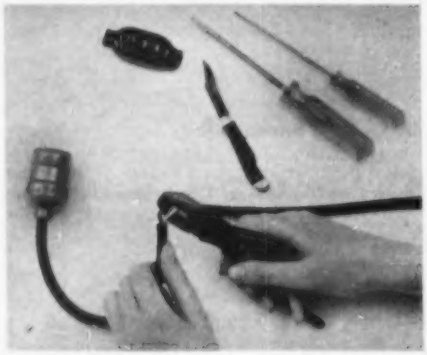


White wire then passes through loop formed by the black one, and knot is ready to be pulled tight. Knot was devised by National Board of Fire Underwriters to minimize fire danger.

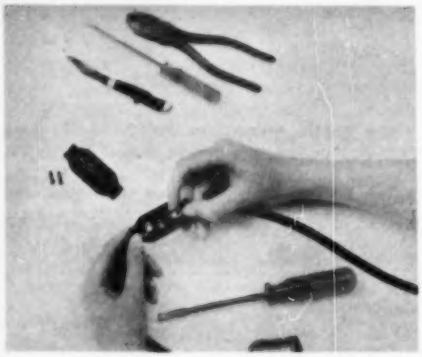
Here's how to put a toggle switch in a power-cord circuit. Only one wire is cut;



To put a line switch on a power cord, first slit outer insulation with knife blade and peel it back to expose the two covered wires beneath.



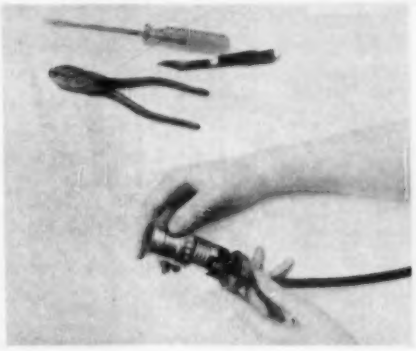
Cut through one of the wires at the center of the exposed length, and strip insulation from each of the ends, leaving enough of it to protect the wires on their way to the binding screws.



Take switch apart, and note how it functions, so you will understand what is wrong in case it fails to work properly. Wrap wire ends around terminal screws—clockwise—and tighten.

of outlet you need for extension photofloods or flash

As you tighten the binding screws, the wires will be wound still more tightly on them. Note that the Underwriters' knot is pulled snugly up against socket base, so cap will fit on easily.



Reassemble the socket by pinching the metal body (look for the side slots that give it flexibility). Push end cap onto the body so that small projections inside rim match crimped edge.

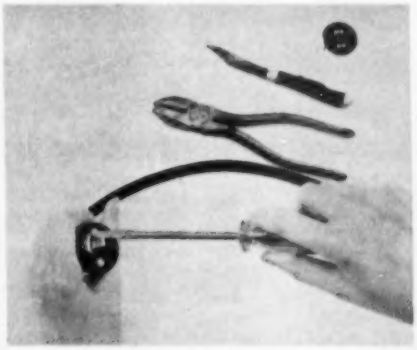
When working with electricity,

DO . . .

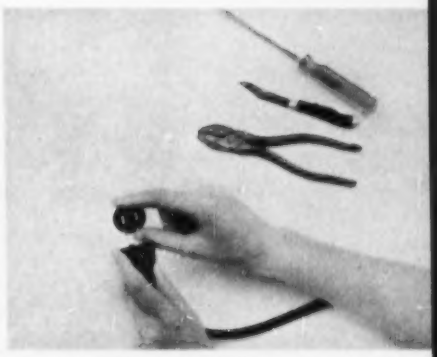
- **—use Underwriters' Approved equipment, wiring, and tools.**
- **—replace fuses with new ones of identical ampere rating.**
- **—disconnect equipment before attempting any repair.**
- **—check appliance wires for wear before each use.**

knot for extra safety when there is strain on the plug.

Strip insulation from both strands, leaving long end of bare wire which makes twisting easier. Wind each wire around its binding screw, in the direction which causes it to tighten with screw.

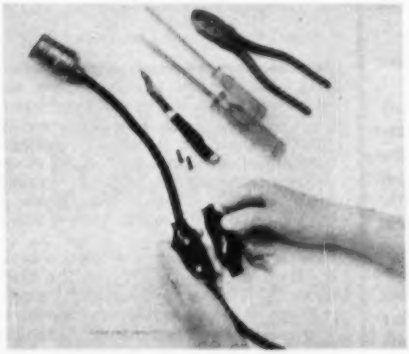


Tighten screws securely. Notice that now the Underwriters' knot is snugly fitted into the center of the plug, and that insulation is still on the wires as they pass around the prongs of the plug.

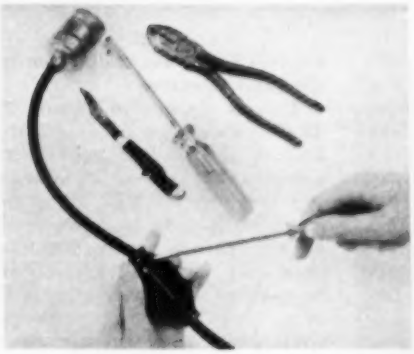


Push on the fiber disk, which is held in place by catching under the inner sides of the two prongs. Don't use a plug without this protective disk; it helps keep screws tight, avoids shorts.

the other remains intact and by-passes the switch



Replace other half of switch. Notice that the outer insulation was stripped just far enough to fit the channels in the plastic case, leaving it intact at the points where the wire enters.



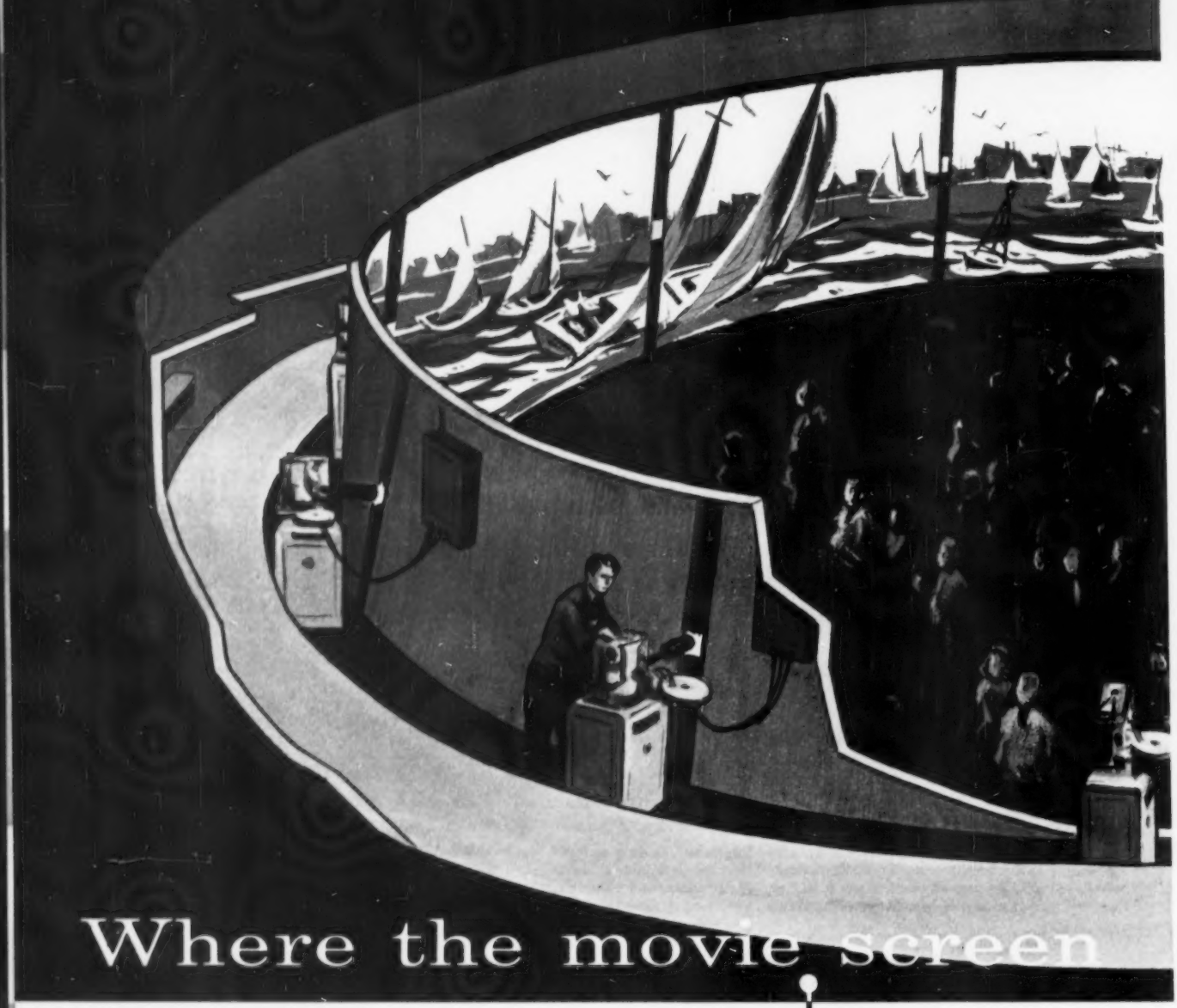
Small screwdriver is required to tighten screws in recesses. Switch has been placed quite near end of cord, for convenience, but not close enough to be affected by heat of a floodlamp.

When working with electricity,

DON'T . . .

- **—bridge burned-out fuses with coin or metal foil.**
- **—make "temporary" or makeshift repairs.**
- **—stand on a damp surface while handling "hot" equipment.**
- **—work on household wiring. Leave it to a licensed electrician.**

DISNEYLAND'S



Where the movie screen

By NORMAN C. LIPTON

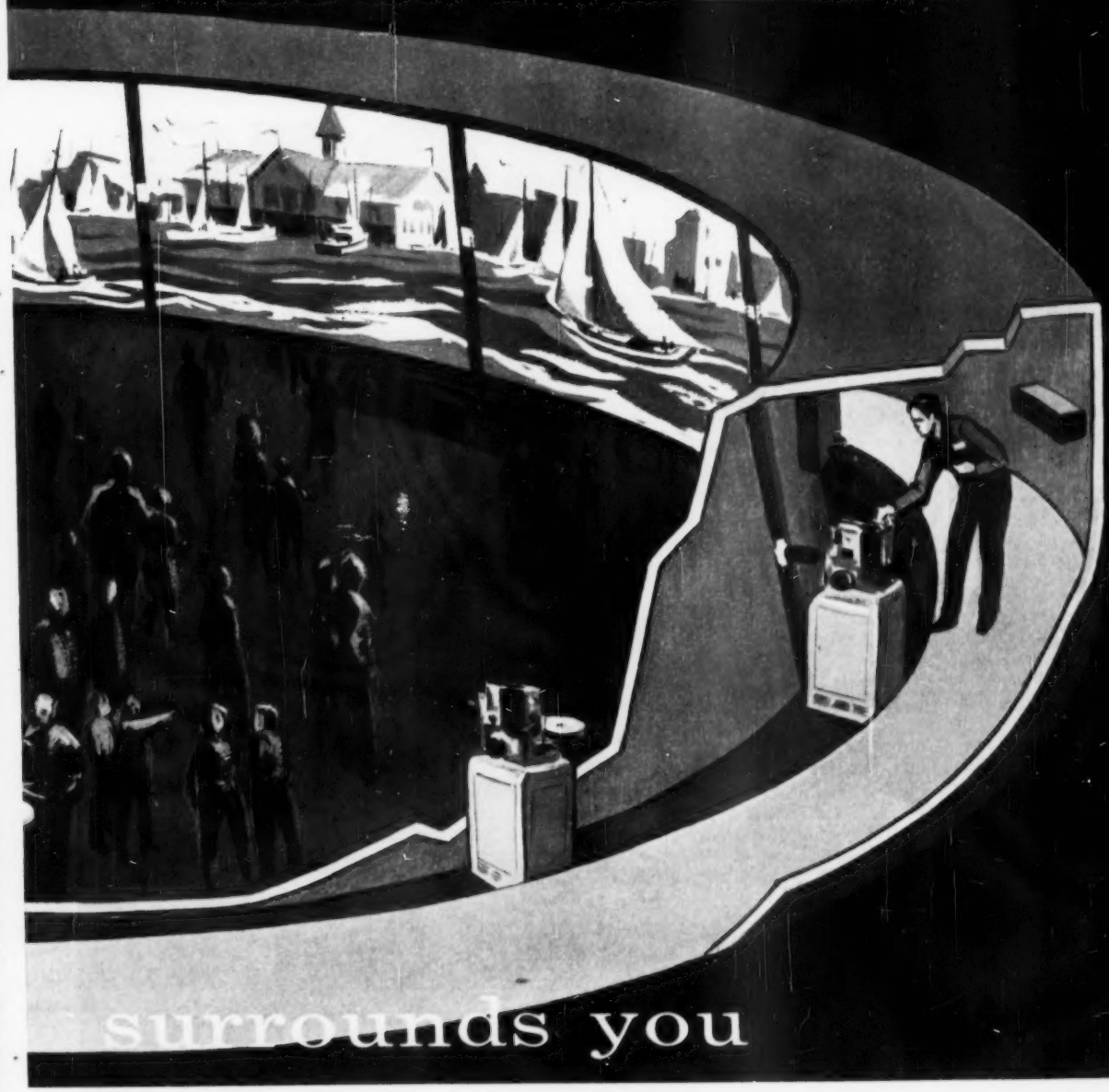
The very last word in wide-screen movie projection was unveiled last July 17 at Disneyland, the unique exposition of fact and make-believe situated on the outskirts of Anaheim, California. The visually and kinesthetically overpowering full-color movie presentation, located at the American Motors Corporation building in the *Tomorrowland* section of Walt Disney's year-around fair, makes use of a 360-degree screen which completely surrounds the audience.

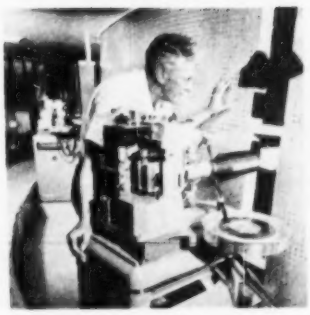
Aptly christened Circarama, the film production represents the ultimate in audience participation to date—a fact that we were able to confirm during a day-long visit at the exhibit shortly after the public opening.

To view the motion picture, the audience stands in an asphalt-paved circular area 40 feet in diameter with the eight-foot-high screen elevated about eight feet off the floor. The circular screen is divided by six-inch-wide vertical black strips into eleven 8x11-foot sections onto which the continuous surrounding motion-picture image is thrown by 11 projectors in apparently perfect synchronism. Oddly enough, the black separating panels add to the illusion of continuity between adjoining sections of the picture. (*Continued on page* 182)

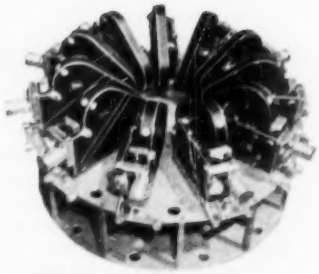
Cut-away drawing, above, shows relationship of 11-section circular screen and respective projectors to audience watching Circarama motion-picture presentation at American Motors Corporation exhibit in Disneyland. Each of the eleven projectors, equipped with a variable-focus 15-mm lens, throws a section of the continuous 360-degree picture image onto the screen directly across the 40-foot (diameter) arena; projection-beam openings are located between the black 6-inch wide strips dividing the 11 screen sections. Attendants are not needed to operate the projectors, merely to replace burnt-out bulbs in automatic lamp changer as well as torn film reels; projector operation, as well as sound record, is synchronized by Selsyn motor controls.

CIRCARAMA





Modified Eastman 16-mm Model 25 projectors have self-loading take-up reels which require no rewinding.



Continuous 360-degree screen image was shot with 11 Cine Kodak Special cameras mounted on a circular steel platform.

Audience attending Circarama presentation scans entire expanse of circular screen, which is elevated 8 feet off the floor.

More

for your camera

A pair of binoculars or a telescope can do as good a job as a long-distance lens for your 35-mm or twin-lens reflex camera—effective focal lengths, 350 to 1500 mm!

RECENT development of four new precision devices to aid the amateur photographer's yen for super-long-distance picture-taking should go a long way toward making easier this eternal desire to see—and photograph—where we customarily cannot. Up until now, if you wanted to photograph home plate from the left-field bleachers, or your child swimming out in a lake, or distant birds, or the tops of tall buildings—or anywhere else where the unadorned camera would produce only a tiny smudge where the center of interest was supposed to be—you had to lay out a lot of money for an enormous, specially computed long-focus or telephoto lens to do the job.

These 200- to 1000-mm beauties still do the best job—undoubtedly—since they were made to do just that. But, have you ever thought of taking pictures through a telescope or pair of binoculars? With the proper care, 'scopes will produce amazingly good photographs—fine enough for most purposes. What you need first is some means for hooking the camera up to the 'scope's eyepiece.

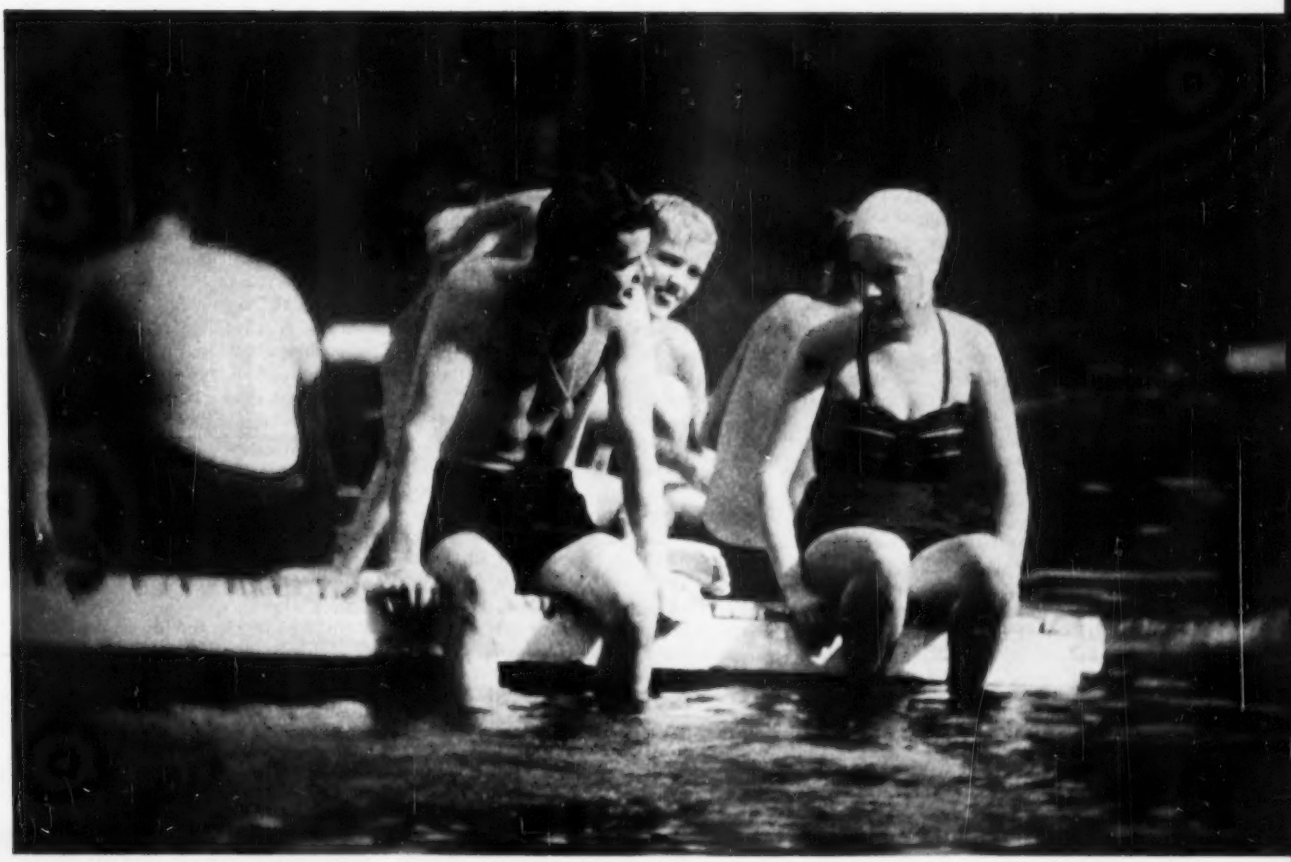
Both the Bushnell Optical Company of Pasadena, California, and Bausch & Lomb Optical Company of Rochester, New York, have come up with interesting solutions to the problem of a rigid, adjustable support for camera and binoculars or telescope. For optimum resolution and sharpness, the camera lens and the 'scope eyepiece must be aligned perfectly. Bushnell's Bino-Foto 35 outfit—developed with the enthusiastic support of W. J. Beecher of the Chicago Natural History Museum, who had been working on the problem for some years with brackets of his own design—provides a rigid flat support for the range-finder 35-mm camera, adjustable for various tripod-socket placements and lens heights. The camera is focused at its nearest distance, the binocular racked all the way out, and the lens then ad-

NORMAL 50-MM lens on 35-mm camera made shot of swimmers about 175 feet away.

90-MM LENS, one of the most common long-focus lenses, was used from same spot.

scope

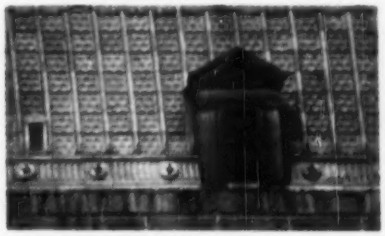
Text and photographs by MICHAEL ALESHIRE



TREMENDOUS MAGNIFICATION (equal to 350-mm lens) was possible when picture was made through 7x50 binoculars held securely in front of camera's 50-mm lens with Bino-Foto bracket; 1/200 sec exposure on Plus-X assured sharp image. (All shots enlarged same degree.)

OVER-ALL VIEW of New York's City Hall Park was made with normal 50-mm lens on an Alpa 35-mm single-lens reflex camera.

MEDIUM SHOT with the 90-mm long-focus lens enlarges central group of buildings, but detail is still too small to be seen.



ULTRA CLOSE-UP of window in pyramidal roof—shot with 30x telescope, Alpa on Tel-Cam adapter—equals image of 1500-mm.

justed at the right eyepiece so it fits snugly into the rubber cup which fits around the eyepiece to keep out extraneous light. Viewing is done either through the left eyepiece—you photograph the largest rectangular area you could place within the binocular's circular field—or through an auxiliary reflex viewer which fits over the left eyepiece to show you the exact field on your negative; approximate parallax correction lines are scribed on the groundglass. With both methods you focus the binoculars, not the camera. Since individual vision can vary considerably, the right eyepiece can be focused separately to account for your own ocular peculiarities; check this with the binoculars alone, remember the number indicated, and keep it set there. For the average person this dial should be set at —.4 unless the reflex viewer is used, in which case it should be set at —.2 *and the camera focused at infinity*. Bino-Foto 35 can also be used with some 35-mm single-lens reflex cameras—but the greatest boon, of course, is to the owner of the "blind" camera.

Possibly the most liberated individuals will be the owners of twin-lens-reflex cameras, who have long been confined to one—and *only* one—focal length; for there is also a Bino-Foto outfit for the double-eyed machine. This works basically the same as Bino-Foto 35, except that both lenses of the camera fit next to both eyepieces. This, of course, enables the user to photograph in a normal position, since the viewing lens looks right through the left eyepiece. Here the adjustable right eyepiece is set at —.2, the camera focused at its nearest distance, binoculars racked out, and a careful matching of the eyepieces and lenses effected. With the lenses as close to the eyepieces as possible—you will vignette the negative if there is too great a separation—you view and focus (with the binoculars' center wheel!) on the ground glass.

Bushnell's crisp binoculars sell for $81.50, each mounting bracket for another $17.50, the calibrated combination iris diaphragm and lens hood for $12.50. One mounting post (to clamp on the center post) will do for both adapters, although their position is different—for which the company provides a small wrench.

An important point to remember is that, by changing the optical relationship between the camera diaphragm and the total image-forming elements, you can no longer use the camera diaphragm. If you do, you will only succeed in vignetting the negative. Depending upon the magnification factor of the particular binoculars or telescope you're using, you have a definite, limited, minimum effective aperture to start from. To determine its value, divide the magnification factor (with a "7x50" binoculars it is 7) into the diameter of the objective (larger) lens—in this case it is 50. Seven into 50 equals *f*/7.1, or in practical terms, *f*/8. This is somewhat limited, of course, but even so, the author had no trouble shooting a night baseball game with Tri-X at this aperture and 1/100-second shutter—development in Promicrol for 18 minutes. (With the iris-diaphragm lens hood you can stop down to *f*/32 if necessary.)

To determine what the effective focal length of your binocular-camera combination is, multiply the focal length of the camera's normal lens by the magnification factor of the glasses. A 7x50 pair of binoculars and 35-mm camera with 50-mm lens is equivalent to a 350-mm lens; the 7x50 with a 75-mm lens for a twin-lens reflex is equivalent to a 525-mm lens.

The Bausch & Lomb Tel-Cam adapter —developed by Dick Nash—for their Balscope terrestial telescope is designed primarily for use with 35-mm single-lens reflex cameras, since with the one-eyed telescope there is no auxiliary "viewer." Eyepieces for the Balscope are interchangeable: 15x, 20x, and 30x (there is a 60x available but it is *celestial*, producing an inverted image). The telescope is relatively long, the magnifications are relatively high, and as a result the Tel-Cam and Balscope must needs be used with a tripod to produce sharp images free from magnified vibrations. Another problem is apparent when you consider the long optical path the light must travel—many times of the binoculars; consequently more light is lost en route to the film. One solution—if your camera has interchangeability of lenses—is to remove the lens and insert your camera maker's extension tubes, one combination for each eyepiece. This removes one of the light-diminishing sources—and according to some authorities, may produce a sharper image than with the camera lens in place. (When photographing in this lens-less way with our Alpa 7, we used extension tubes 2 and 4 with the 15x eyepiece, numbers 2 and 3 with the 20x, and 1 and 2 with the 30x.) On the last tube you place a special hood which fits smoothly over the eyepiece when the camera is moved forward on the twin rails of the Tel-Cam.

Replacing the camera lens with extension tubes is not absolutely necessary; sharp, accurate pictures have been made with a Contaflex single-lens camera whose lens is not removable. The 30x eyepiece was used, the eyepiece hood fitted into place as closely as possible.

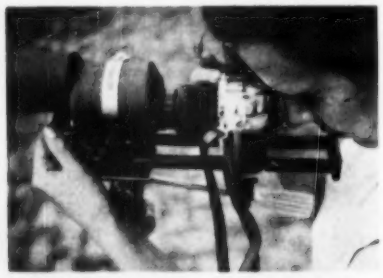
For the owner of the rangefinder 35-mm camera, Tel-Cam provides a pivoting front element which enables the camera to be swung out of way while it is on the adapter, the telescope focused and fixed on some nonmoving object, and the camera then swung back into place at the eyepiece.

Price of the Tel-Cam adapter (available through Bausch & Lomb authorized distributors) is $45.75.

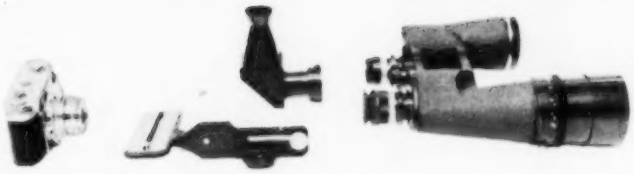
Simplest device of all is that made by the manufacturers of the Alpa. This is a one-inch-thick metal ring, with an opening on one side for the lens-hood groove of the 50-mm Switar lens, the other for the eyepiece of 7x50 Kern or similar binoculars. A large knob tightens a ring down so the combination will stay in place. Focusing is done with the center wheel.

If the Alpa ring and binoculars are used hand-held, there may be an unhealthy amount of (*Continued on page* 185)

SIMPLE COUPLING device for the Alpa single-lens reflex consists of ring to join binocular eyepiece, 50-mm Switar lens; large knobs tighten it in place. Special clip holds the binoculars securely on the tripod head.



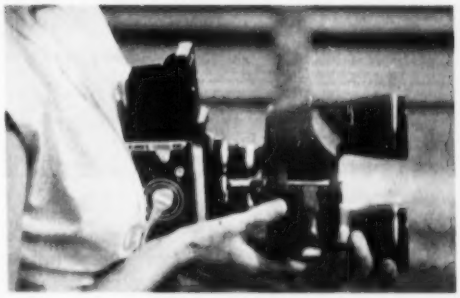
TEL-CAM adapter for terrestial telescope is used here with single-lens reflex; lens was removed, replaced with proper extension tubes to increase light transmission. The *scope* must be focused—not the camera.



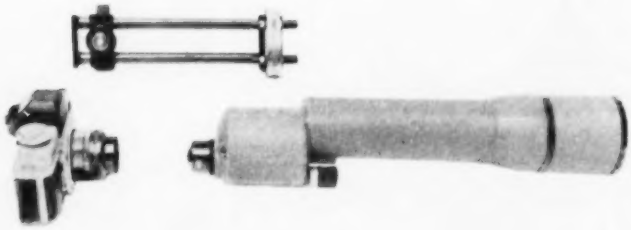
BUSHNELL BINO-FOTO outfit for 35-mm rangefinder cameras consists of mounting piece (front), viewing focusing aid (back), 7x50 binoculars, and a calibrated iris-diaphragm lens hood.

ASSEMBLED package is compact, easy to operate, hand-held. Vertical format is necessary unless device is turned to horizontal position, the reflex viewer is used in sidewise manner.

TWIN-LENS REFLEX Bino-Foto adapter is similar to the 35-mm bracket, but devised so both camera lenses "look through" both eyepieces. Rubber caps help keep out unwanted rays of light.



NORMAL picture-taking position for twin-lens-reflex camera and Bino-Foto adapter means reasonable flexibility in shooting. Focusing is done with the center wheel, as shown in above photo.



TEL-CAM adapter (back) provides sliding, elevating, and swinging controls for exact adjustment of the camera to the eyepiece of the Bausch & Lomb Balscope telescope as shown at right.

TELESCOPE arrangement is most versatile with single-lens reflex; rangefinder cameras can photograph still objects by swiveling the adapter, and focusing and repositioning the camera.

1955 contest

the winners

Congratulations to the winners of the 1955 POPULAR PHOTOGRAPHY International Picture Contest! This year the judges were unable to agree on the fifth prize, and consequently awarded duplicate prizes to the two deadlocked pictures. You'll find more than 50 of the prize-winning pictures in color and black-and-white reproduced in this issue, and a complete list of winners at the end of the picture section. Elsewhere in the issue will be found contestants' data on how their pictures were made.

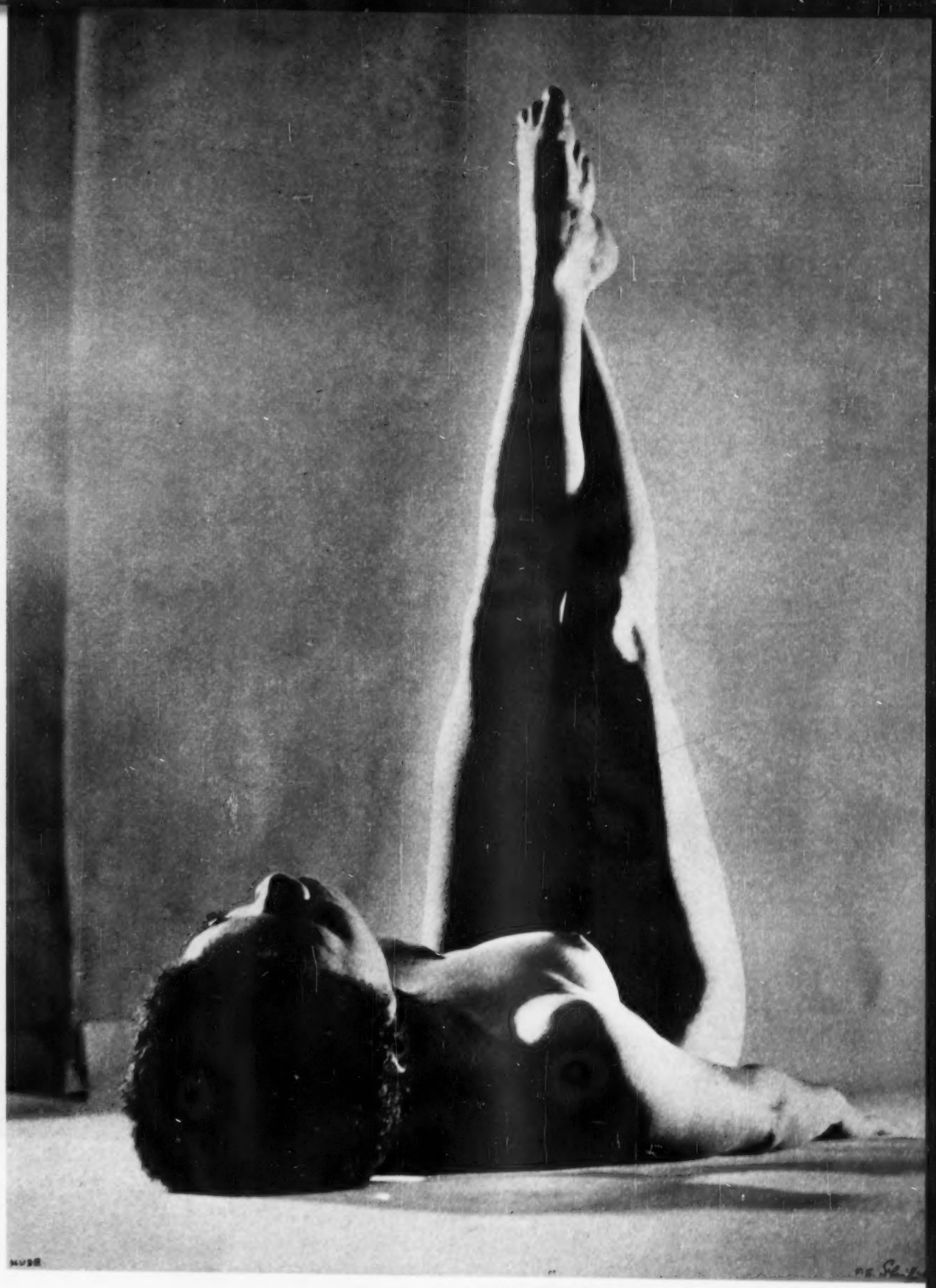
BLACK-AND-WHITE

FIRST PRIZE

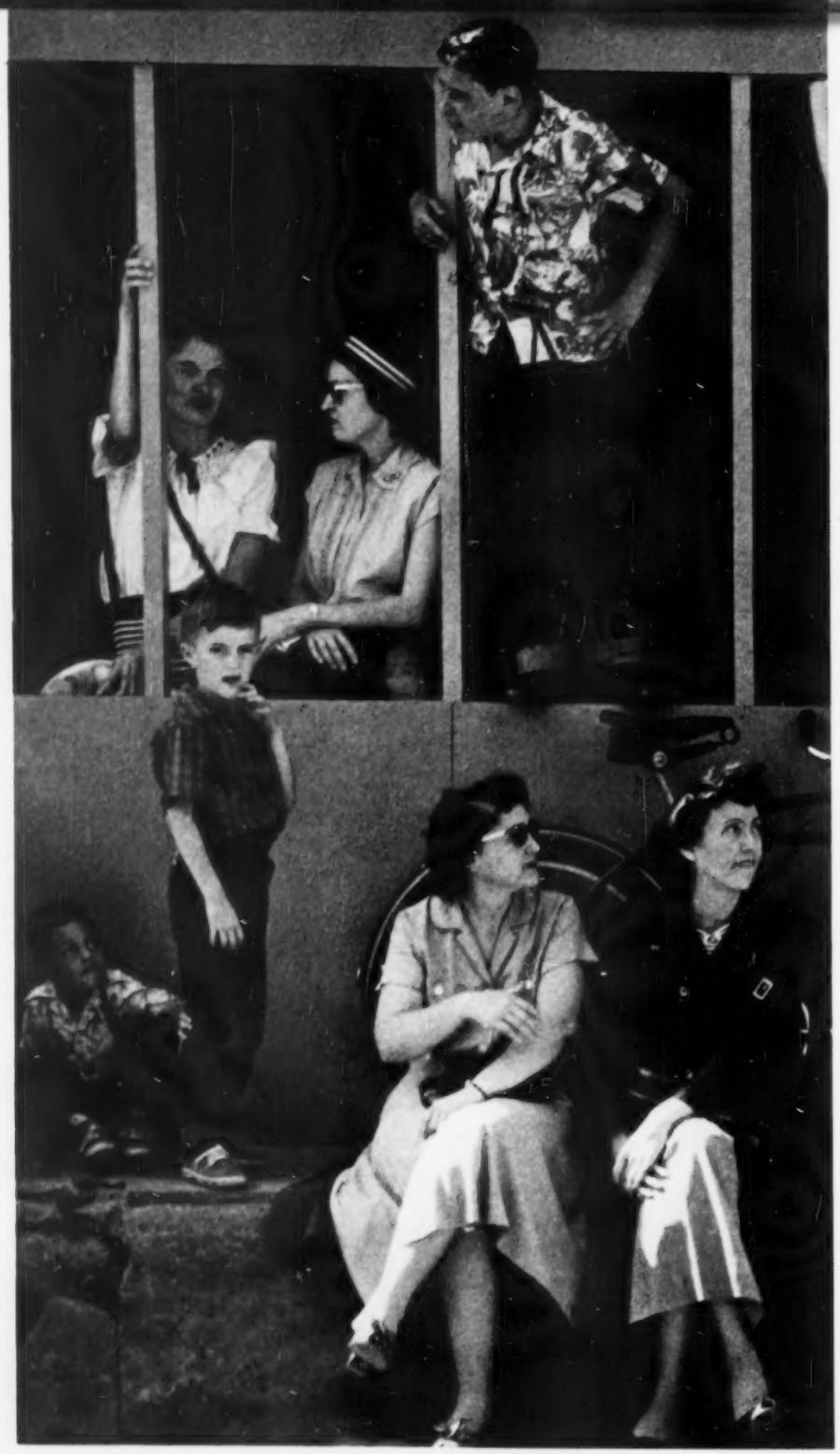
FESTIVAL by Hideichiro Katayama, Japan

SECOND PRIZE TANGLED NET by Michael A. Mardikes

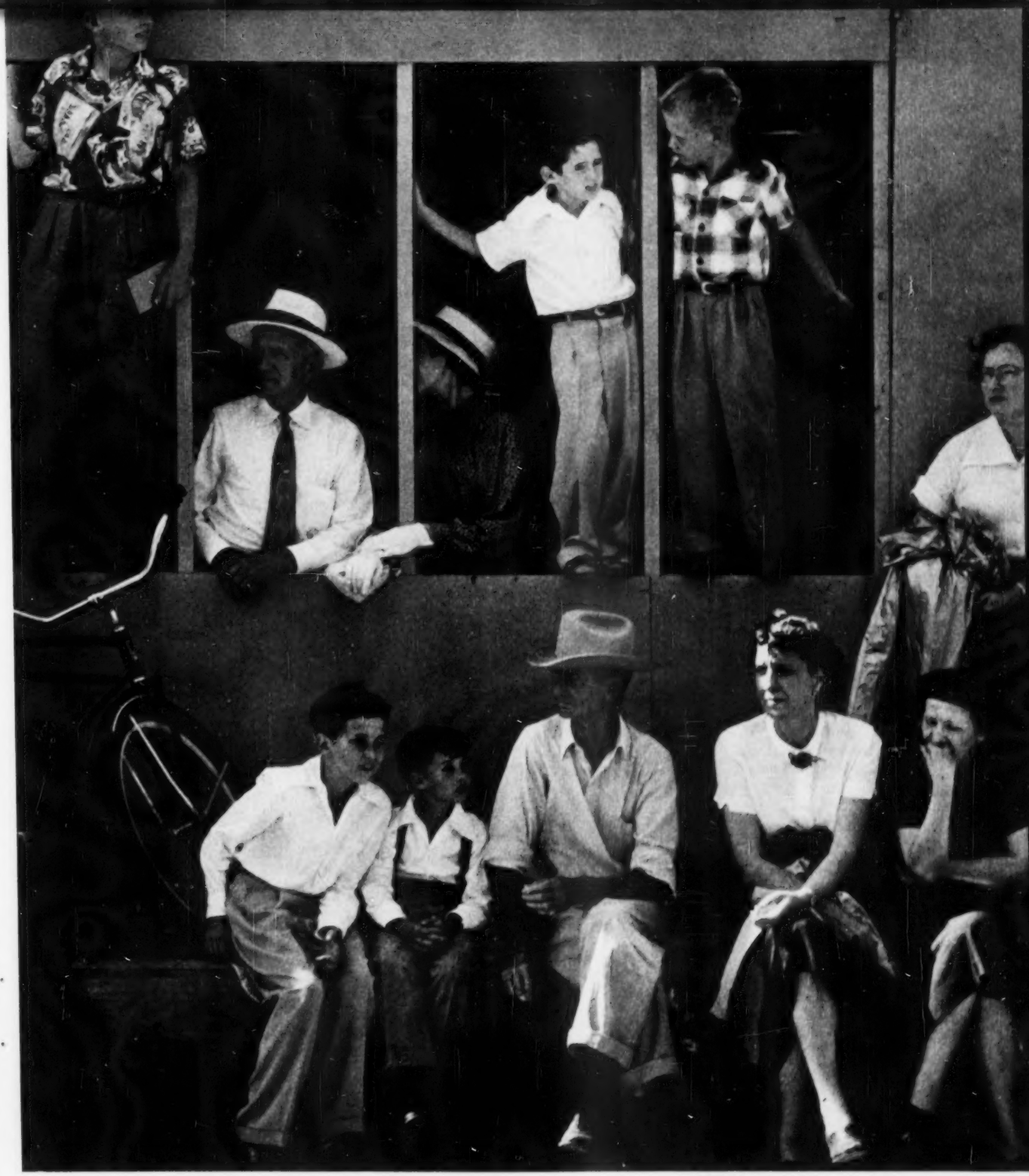
THIRD PRIZE GYPSY GIRLS **by Otto Baettwyler,** *Switzerland*



FOURTH PRIZE NUDE **by Fred S. Schiffer,** *Argentina*



The pictures on these two pages and the following spread tied for **FIFTH PRIZE**—the first tie in the



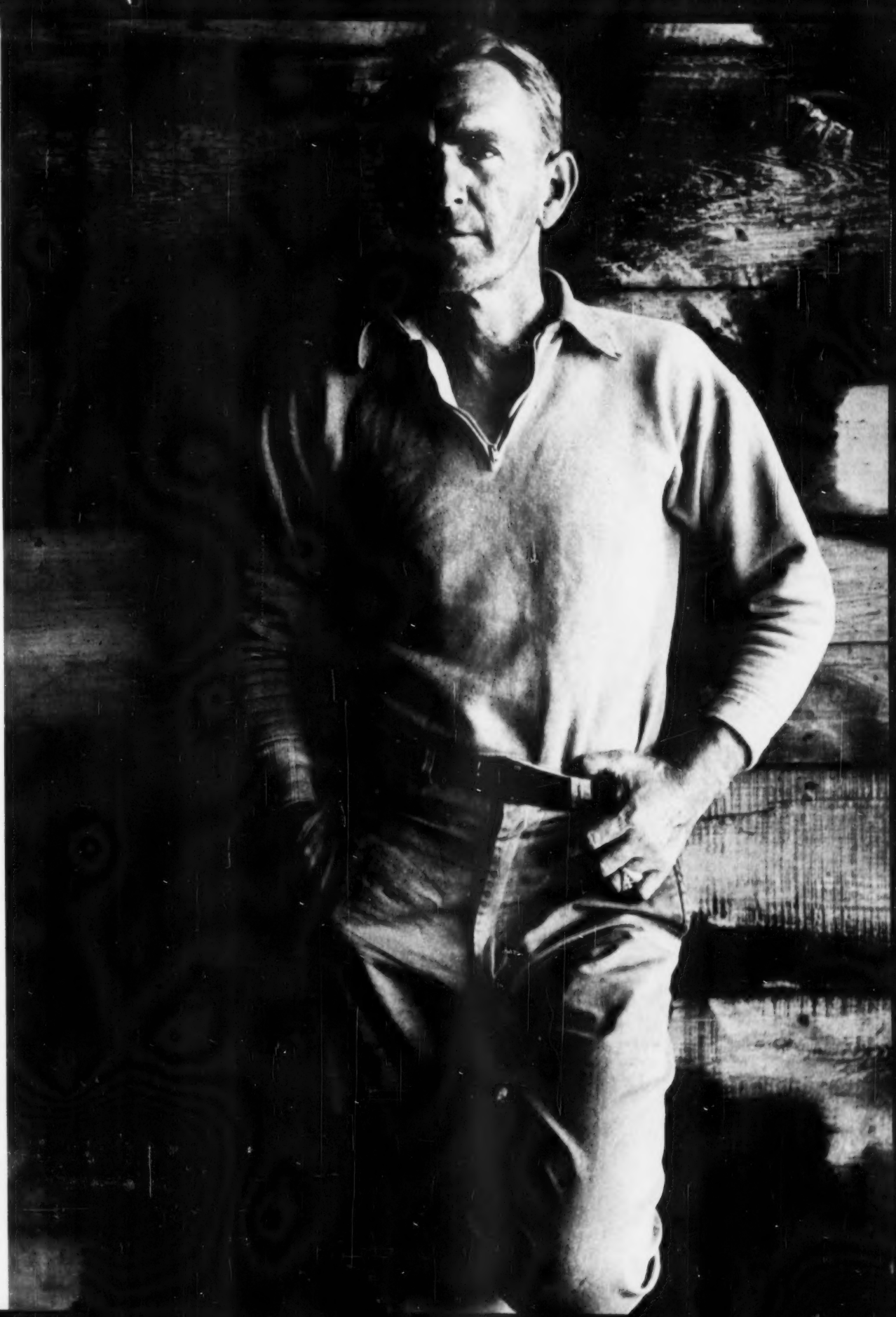
FIFTH PRIZE PARADE by John Rogers

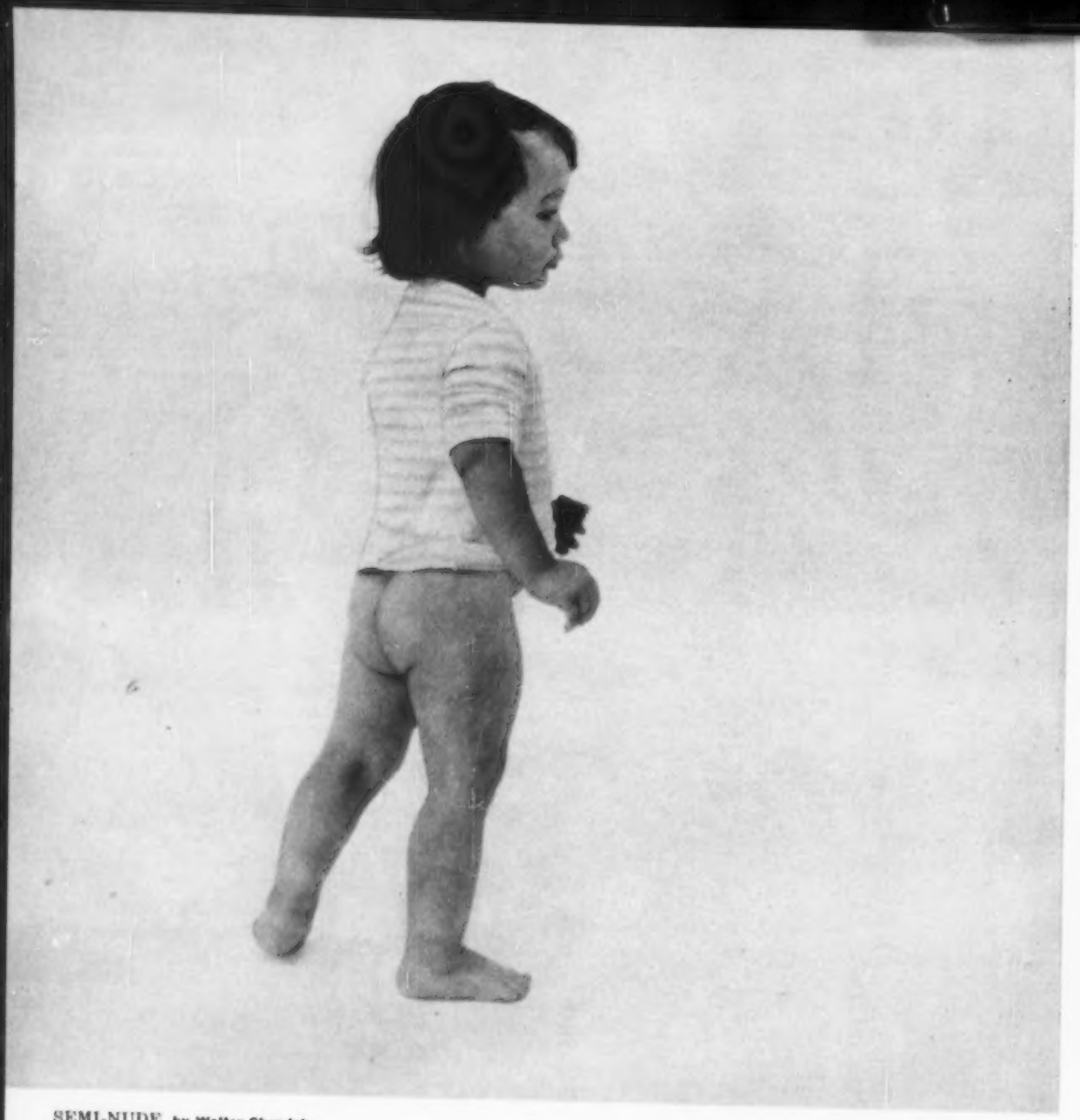
history of the POPULAR PHOTOGRAPHY picture contest. Duplicate prizes were awarded.

FIFTH PRIZE SUMMER EVENING by **Antonio Migliori**, *Italy*

MR. SMITH
by Michael A. Mardikes

MAMBO by Leo Stashin



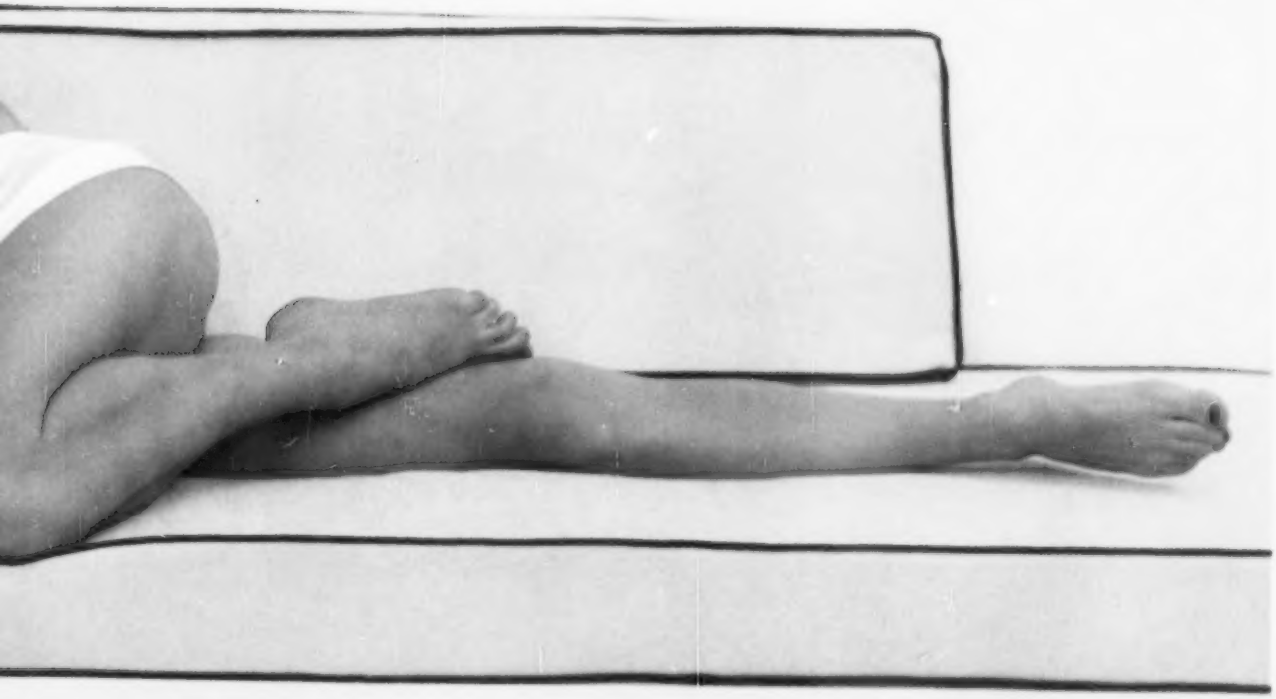


SEMI-NUDE by Walter Chandoha

COLOR

FIRST PRIZE

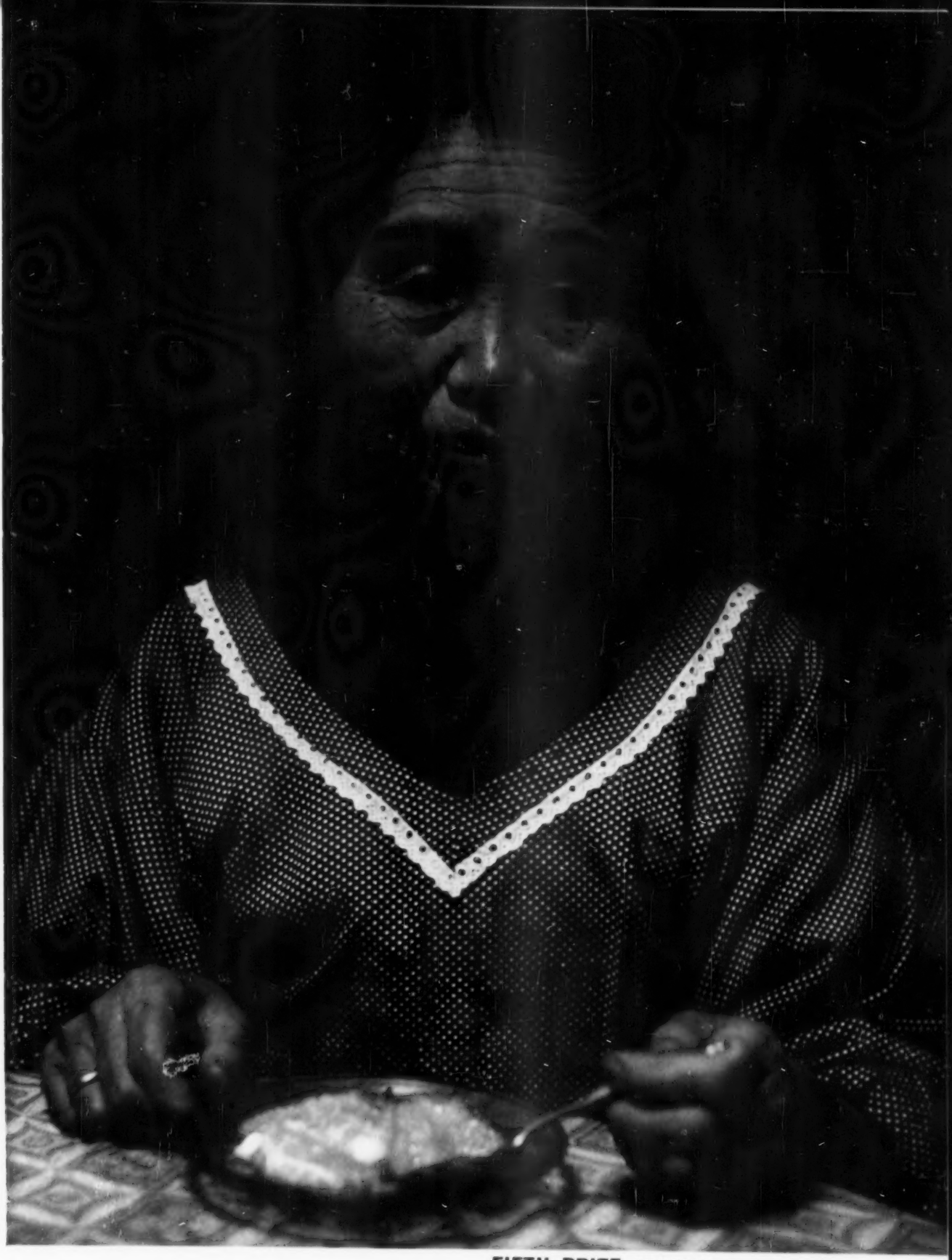
BARBARA by Dan Rubin



SECOND PRIZE SYDNEY SILKY TERRIER by Walter Chandoha (see cover)

THIRD PRIZE FOX HUNT by Joe Clark

FOURTH PRIZE MODEL by Joseph H. Maddocks



FIFTH PRIZE OBA-SAN by Elrvin M. De Witt, Jr.

PIGEON POINT LIGHT by Elmore C. Adams

POLE VAULTER by Raymond L. Propst

LEAVES by Benn Mitchell

CIRCUS by John D. Walker

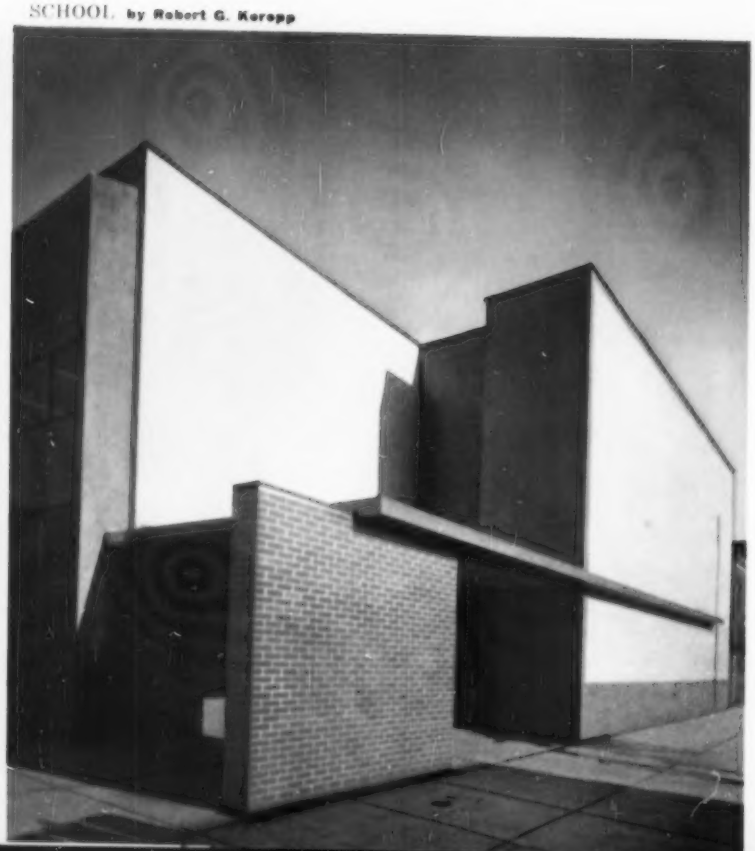
BROTHERS by Jackson W. Fritz

CATHY by Thomas Tucker

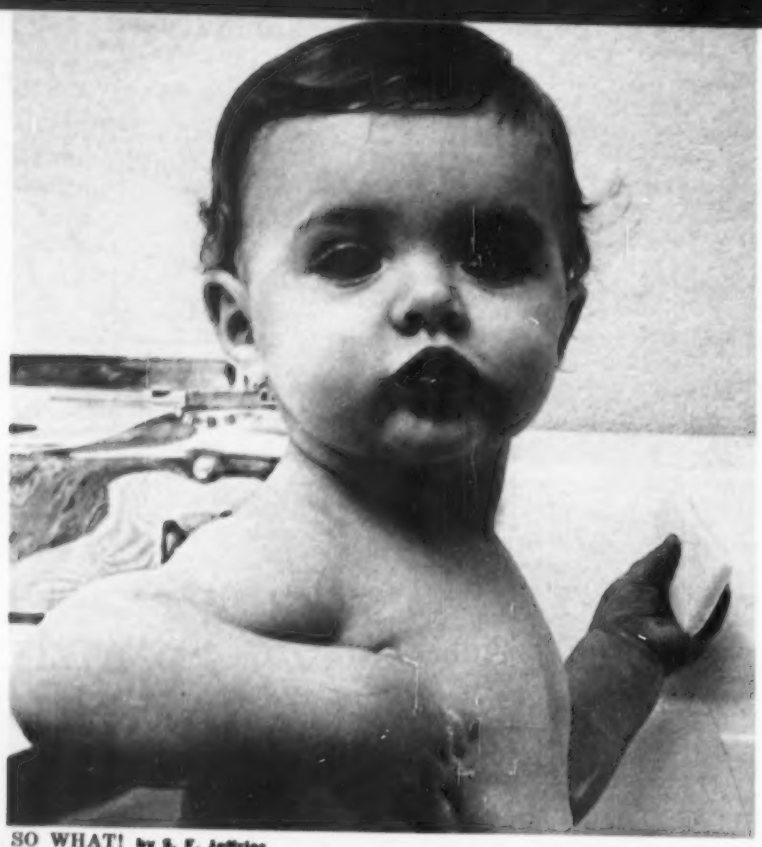
CASINO DANCER by John A. De Visser

MONTMARTRE by Lee de Raemy, *France*

SCHOOL by Robert G. Kerepp



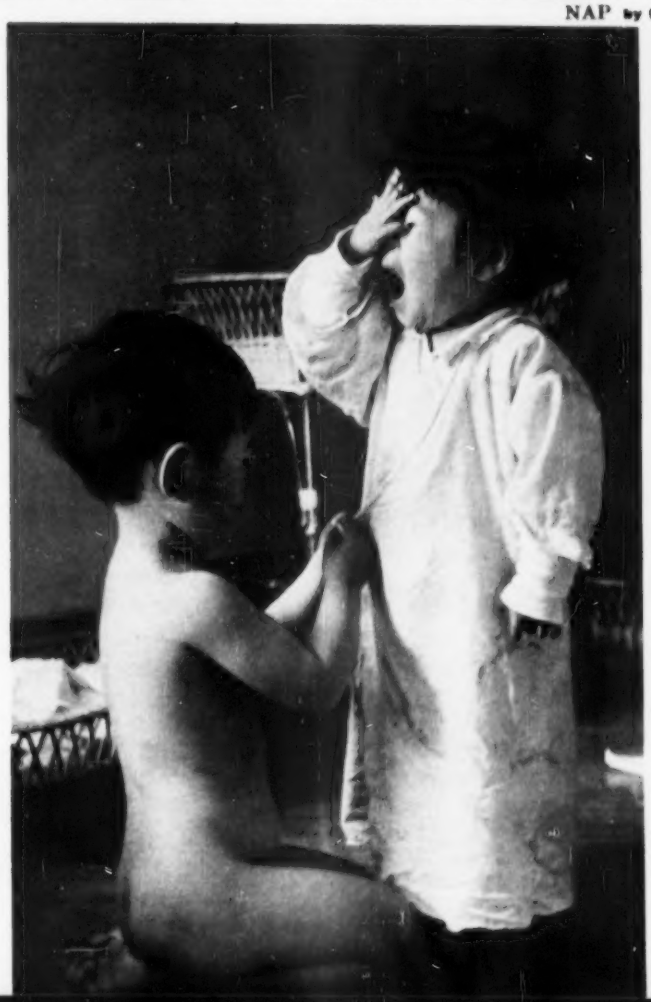
SWISS LANDSCAPE **by Adolf Wetzel,** *Switzerland*



SO WHAT! by S. F. Jeffries

CONSTANCE by Bernard McCabe

NAP by Nick Gevjlek, *Canada*



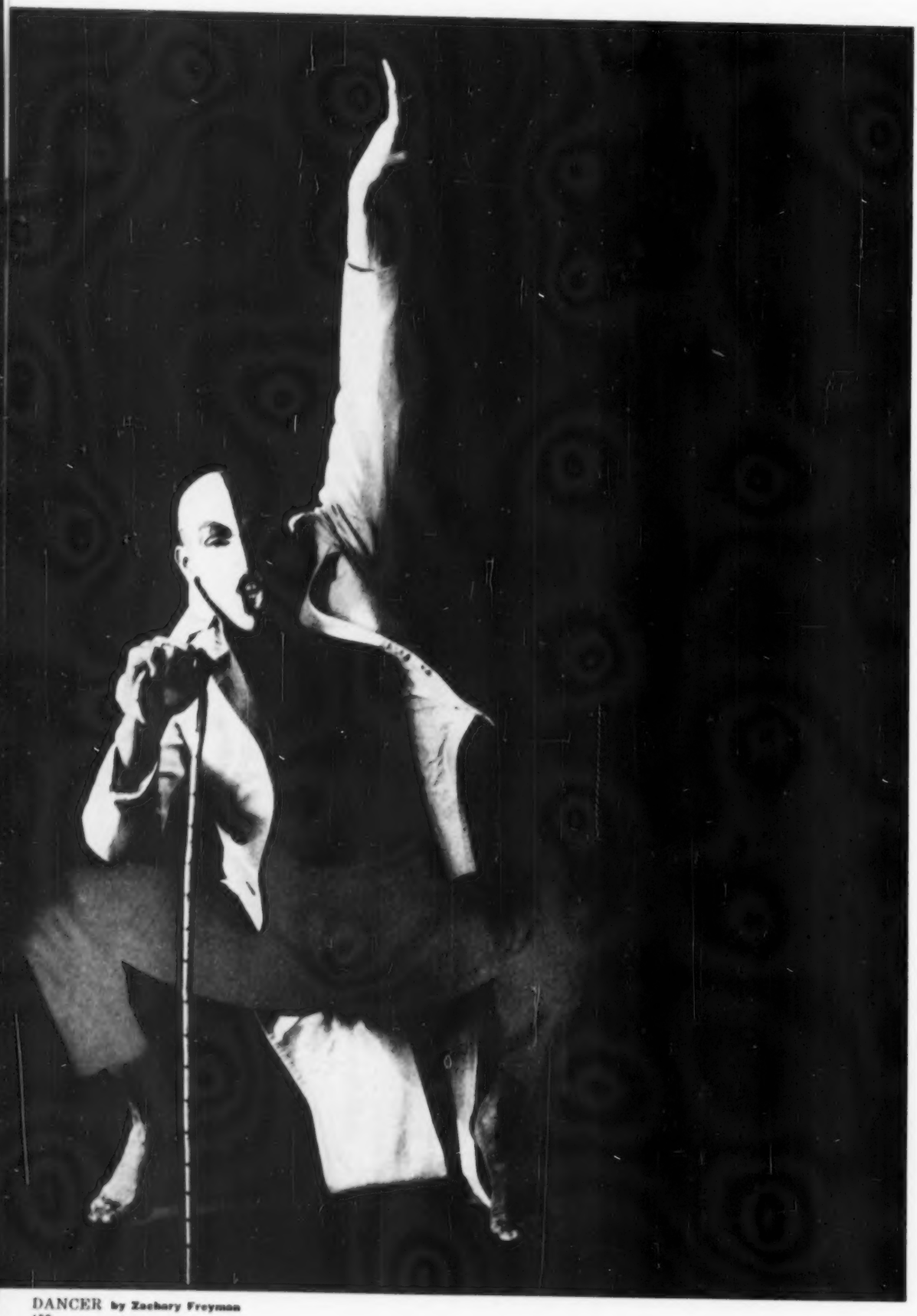
BROTHER AND SISTER
by Hisao Kato, *Japan*

BATHERS by Shuji Ishii, *Japan*

UMBRELLA by Ayao Emoto, *Japan*

JEANNE by Kurt Blesinger

MOROCCO by Kurt Blesinger



DANCER by Zachary Freyman

FENCERS by Jack Fields

DOUBLE EXPOSURE by Kyoichi Matsumoto, *Japan*

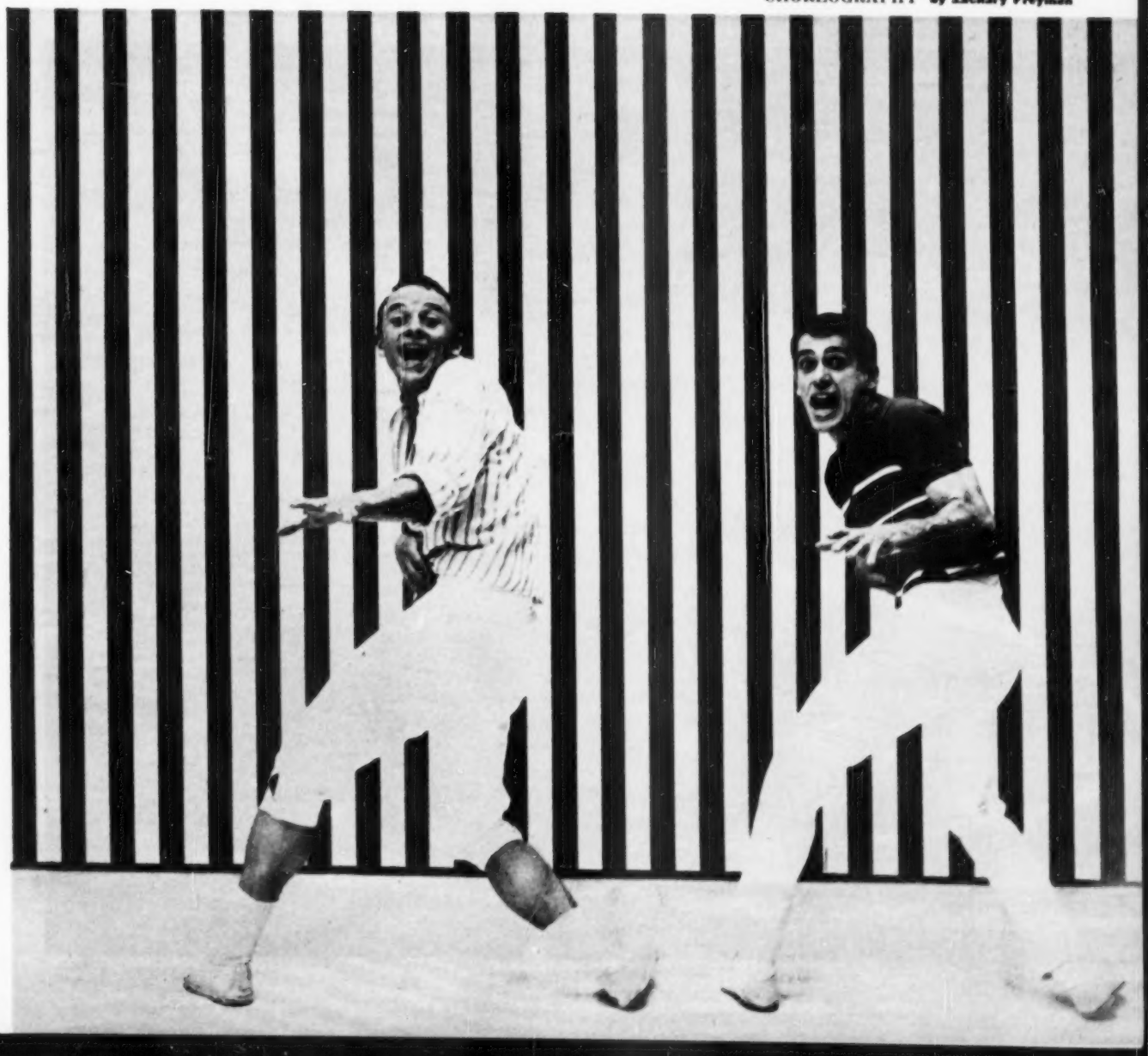
TORSO by Tullio Stravisi, *Trieste*

WINTER SCENE by Robert Folley

LIGHTNING by William A. Barnes

SWIRL by Zachary Freyman

CHOREOGRAPHY by Zachary Freyman

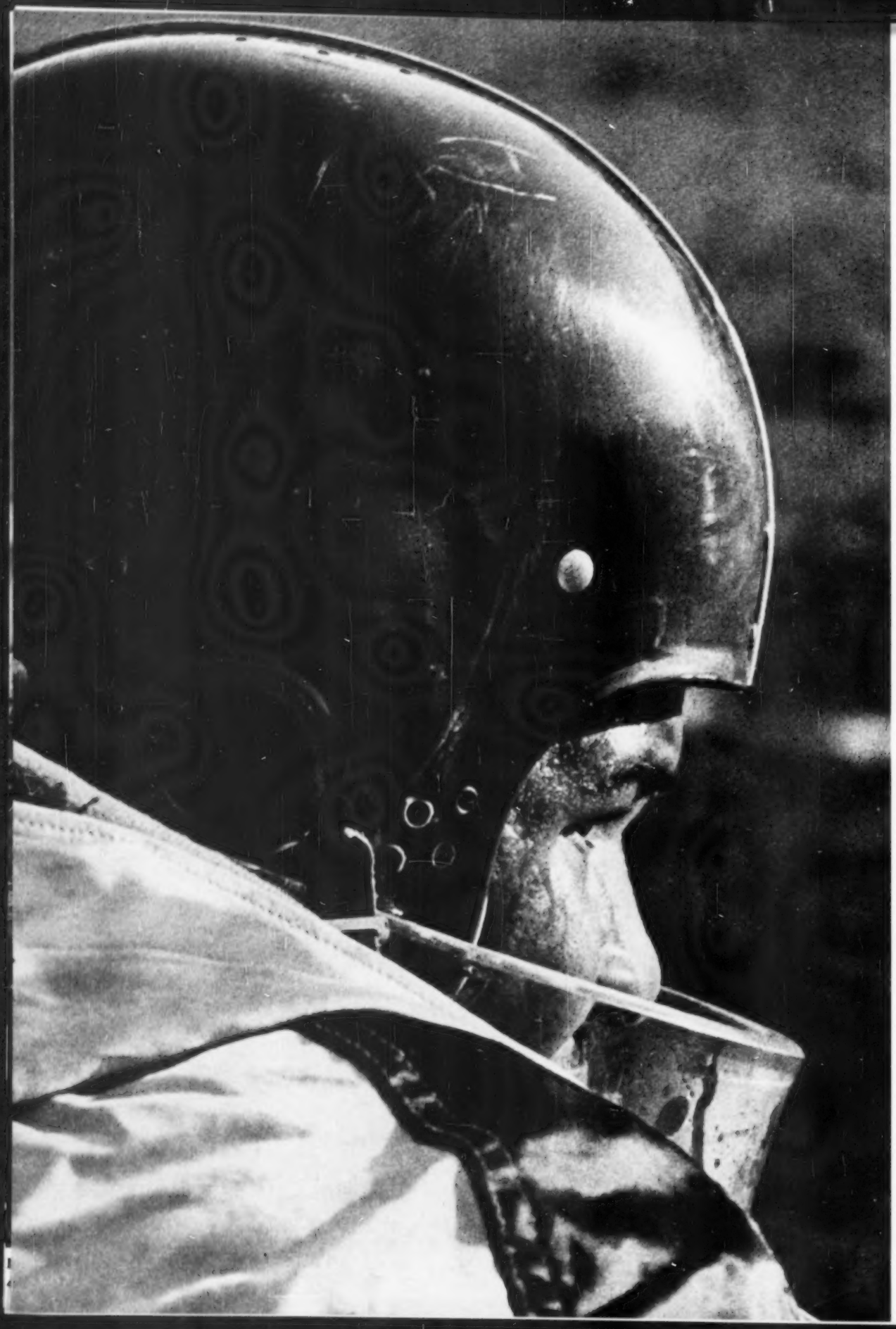


BETTY ANNE by Paul Duckworth

WHITE HEAT by Henry Fagliano

DIVERS by Tsugao Yanagiya, *Japan*

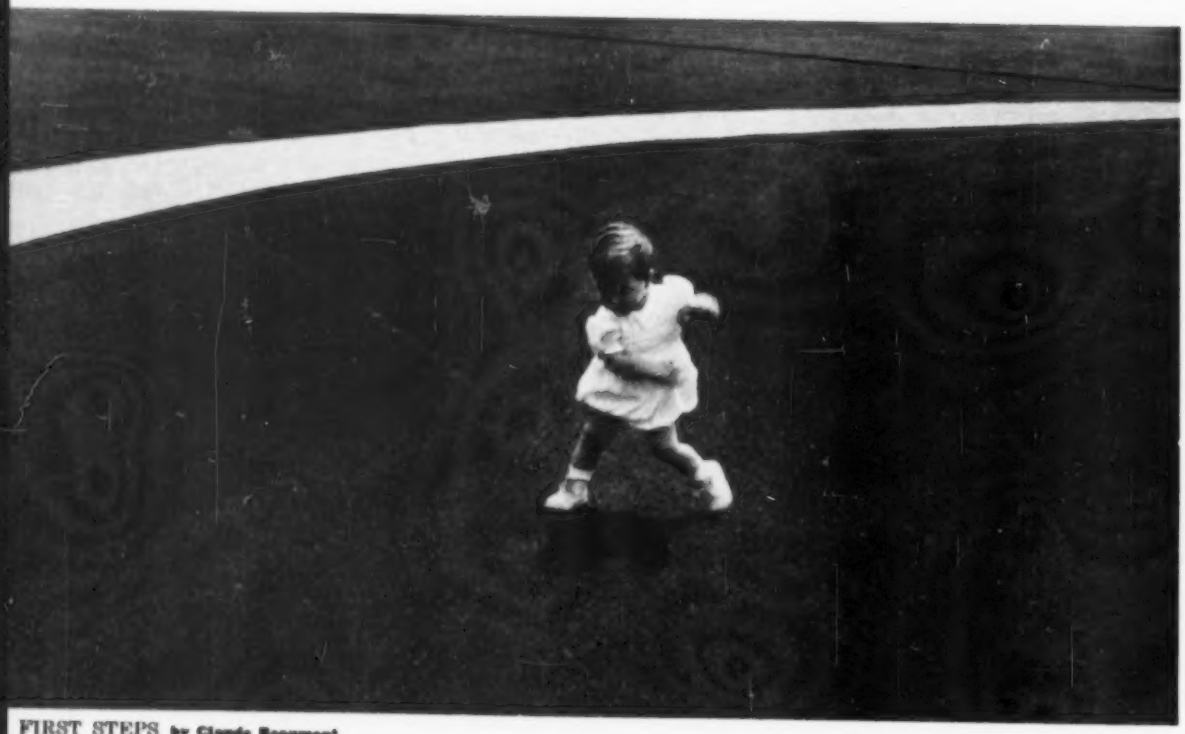
SIGRID by Edouard Kutter, Jr., *Luxembourg*



JOE PERRY by Henry Fagliano

FATHER AND SON by Zvonko Glyck

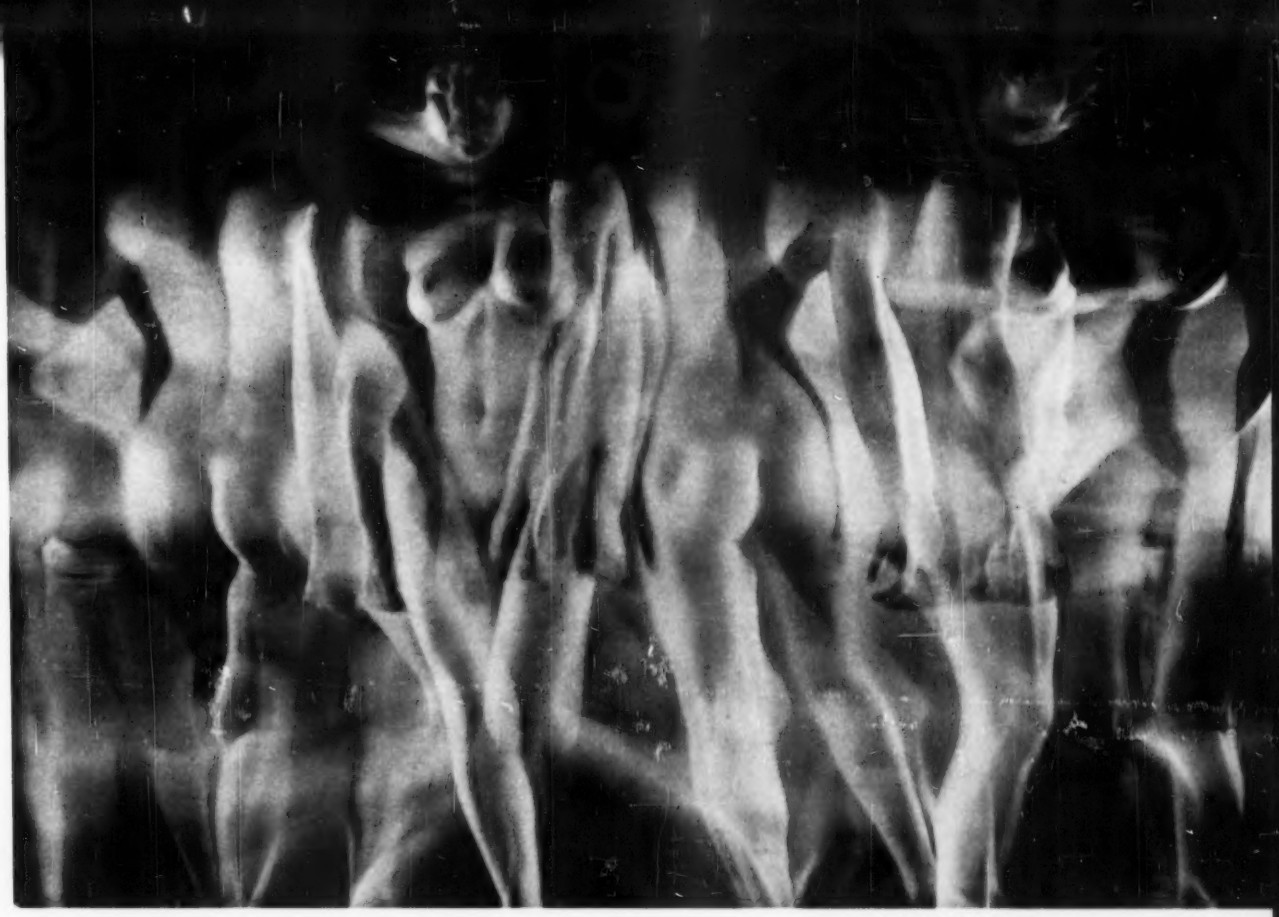
BALLERINAS by Ann Zane



FIRST STEPS by Claude Beaumont

PINNY by Morris H. Jaffe

CONEY ISLAND by Ronald Lumachi

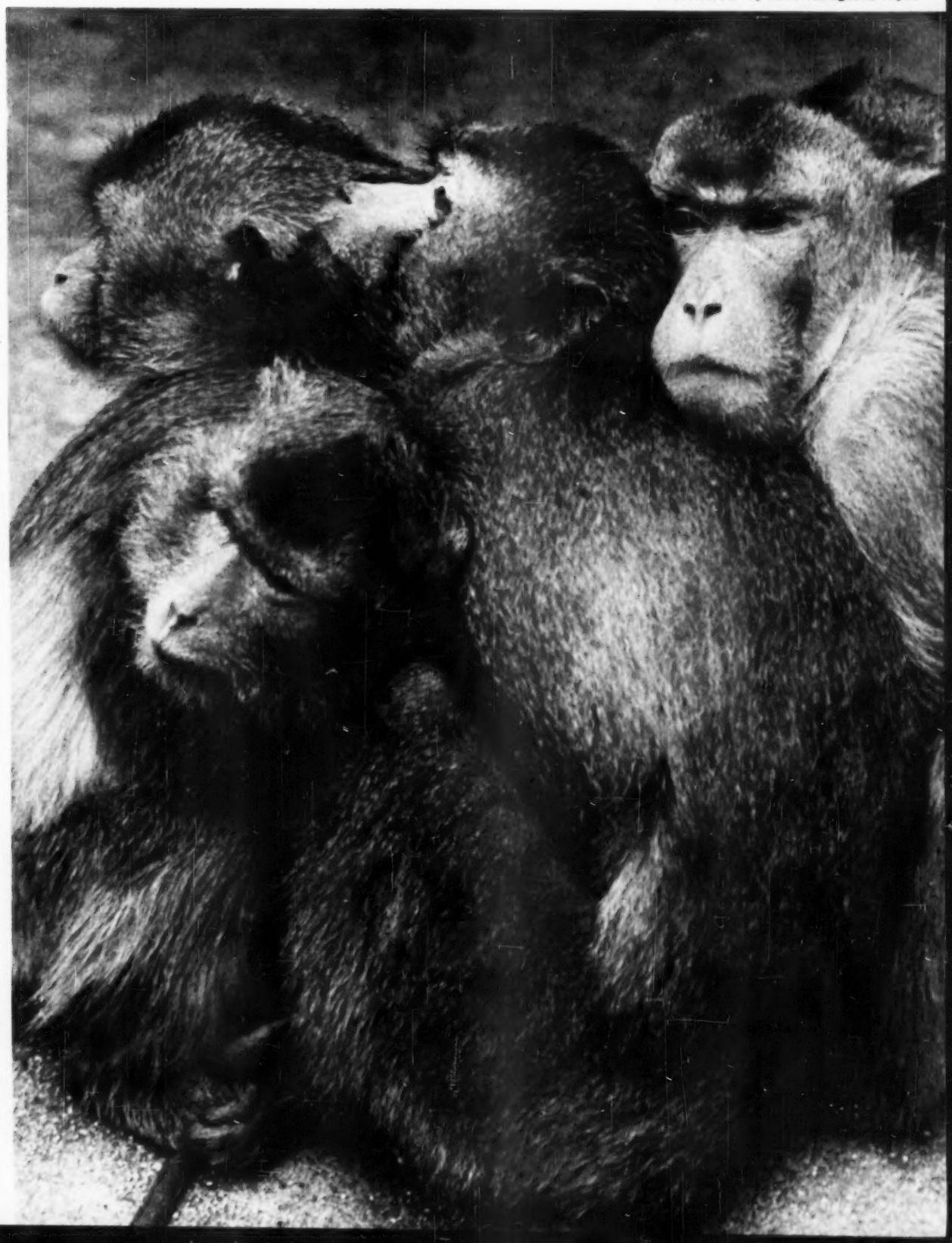


MOVING NUDE by Kero Honjo, *Japan*

AMSTERDAM by Theo Scheffer, *Holland*

ADVERTISING by Piero Donzelli, *Italy*

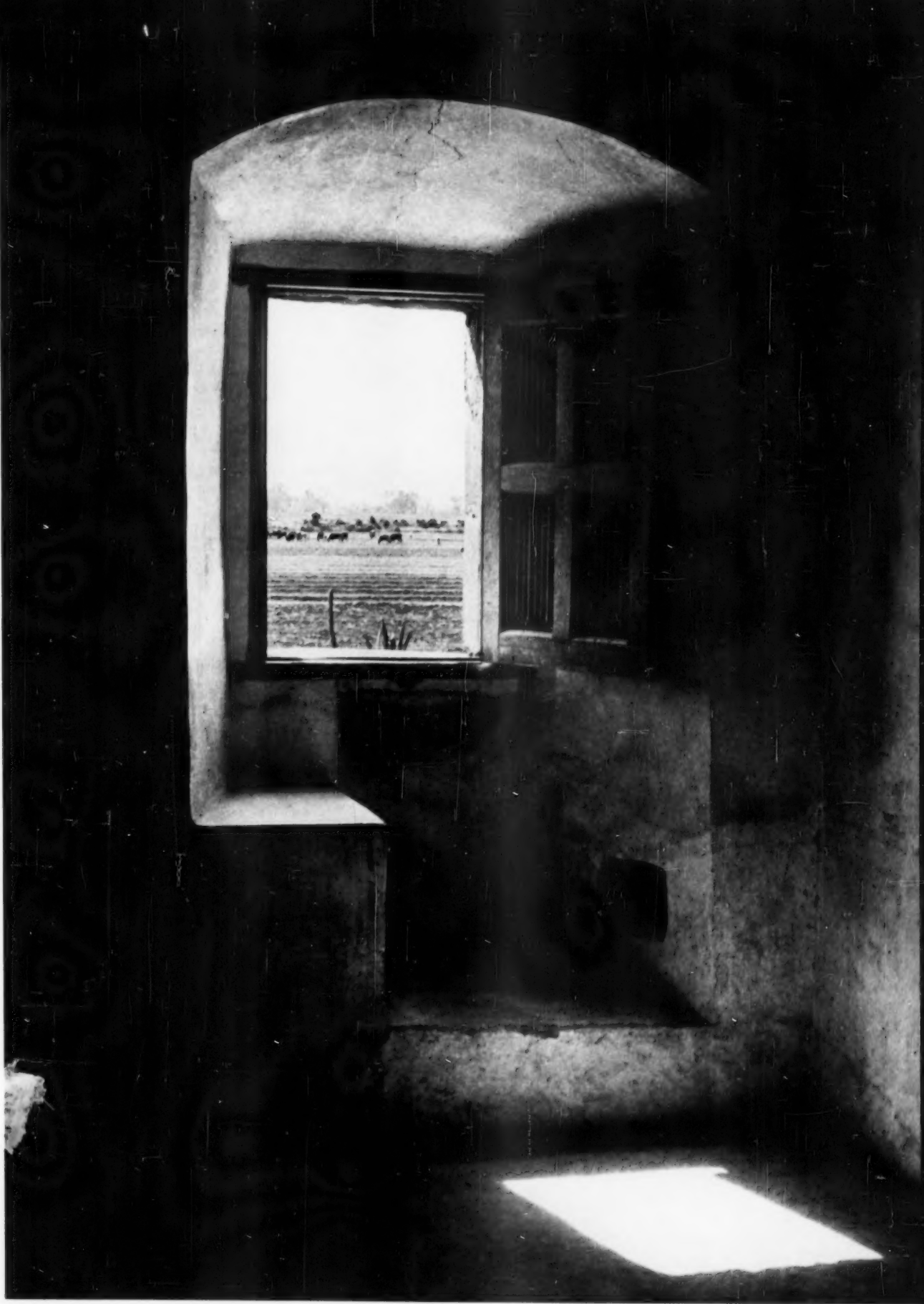
MONKEYS by Masa Yamaguchi, Japan



PILOT by Arthur Truss

MORGUE KEEPER by Jay Spencer

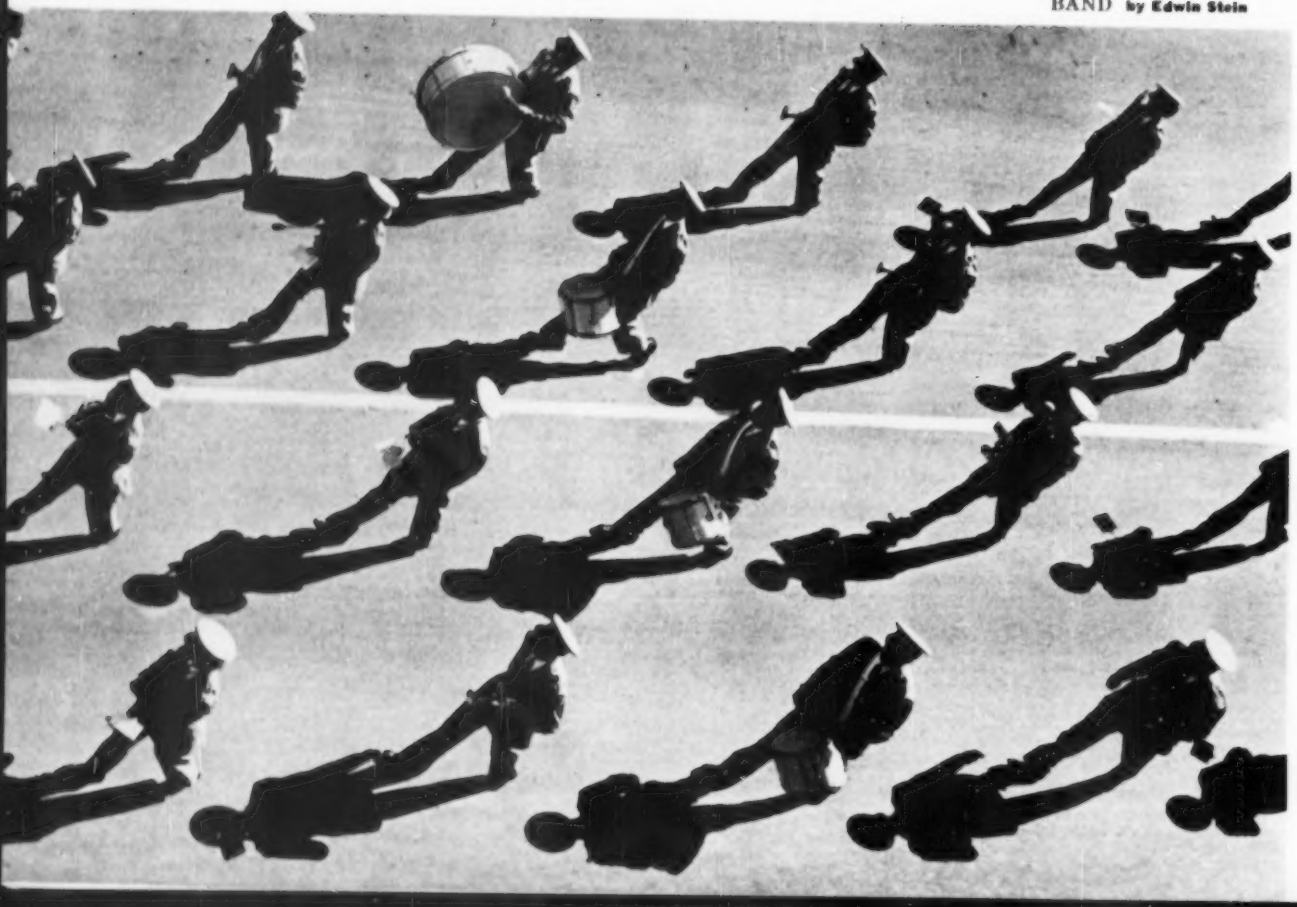
WOMAN by Eugenio Petrarelli, *Italy*



MEXICAN WINDOW by William F. Stichle

SINGLE FILE by Palmer M. Pedersen

BAND by Edwin Stein



PRIZE WINNERS

in the POPULAR PHOTOGRAPHY 1955 International Picture Contest

color

first prize.....$2,000

U. S. Savings Bond Plus Trophy
"BARBARA" by Daniel R. Rubin
New York, N. Y. (page 115)

second prize.....$1,000

U. S. Savings Bond Plus Trophy
"SYDNEY SILKY TERRIER" by Walter Chandoha
Huntington, N. Y. (cover)

third prize.....$750

U. S. Savings Bond Plus Trophy
"FOX HUNT" by Joe Clark
Detroit, Michigan (page 116)

fourth prize.....$500

U. S. Savings Bond Plus Trophy
"MODEL" by Joseph H. Maddocks
Hollywood, California (pages 117-118)

fifth prize.....$250

U. S. Savings Bond Plus Trophy
"OBA-SAN" by Lt. Eirvin M. DeWitt, Jr.
Jacksonville, Florida (page 119)

50 prizes U.S. Savings Bonds each.....$100

"Pigeon Point Light," by Elmore C. Adams, San Francisco; "Still Life," by Leonard Balish, New York; "Boys Delight" by Thomas F. Bastet, Lachine, Canada; "Merry-go-round," by William R. Breg, Southbury, Conn.; "Fast Kitten," by Walter Chandoha, Huntington, N. Y.; "Jazz II," by Jerry Dantzic, Brooklyn, N. Y.; "Player," by Frederick E. Delany, Jr., Hartford, Conn.; "Montmarte," by Leo de Raemy, Paris, France; "Peaceful Harbor," by Charles A. Desmarais, Fall River, Mass.; "Casino Dancer," by John De Visser, Toronto, Canada.

"Eskimo Mother and Child," by Frank Dool, Ottawa, Canada; "Diana," by Graham S. Finlayson, Southampton, England; "Early Morning," by Robert A. Freson, New York; "Pinwheels," by Harvey C. Friedentag, New York; "Brothers," by Jackson W. Fritz, Baltimore; "Garden in Moonlight," by Ira E. Graham, Chicago; "Bridge Cable," by Virna Haffer, Tacoma, Wash.; "Refinery," by M. Z. Haque, Ahmadi, Kuwait; "Minstrel," by Oliver P. Harwood, Los Angeles; "Nude Mother and Child," by Charles B. Helm, Roseville, Mich.

"French Art," by Harry Kalatian, W. New York, N. J.; "Water, Please!" by Charles Kirk, New York; "Two Teeth," by Matthew J. Konold, Omena, Mich.; "School," by Robert G. Koropp, Glenview, Ill.; "Luftballoons," by Siegfried Kuhn, Bern, Switzerland; "Red Accent," by Grey Lacey, Omaha; "Moonlighted Bay," by Dean D. Lawellin, Denver; "Red Building," by Saul Leiter, New York; "Child with Apple," by Irwin Lubroth, N. Y.; "Export Lines," by Jay Maisel, N. Y. *(Continued on page 204)*

black and-white

first prize.....$2,000

U. S. Savings Bond Plus Trophy
"FESTIVAL" by Hideichiro Katayama
Nagoya, Japan (pages 102-103)

second prize.....$1,000

U. S. Savings Bond Plus Trophy
"TANGLED NET" by Michael A. Mardikes
Kansas City, Missouri (pages 104-105)

third prize.....$750

U. S. Savings Bond Plus Trophy
"GYPSY GIRLS" by Otto Daettwyler
Menziken, Switzerland (page 106)

fourth prize.....$500

U. S. Savings Bond Plus Trophy
"NUDE" by Fred S. Schiffer
Buenos Aires, Argentina (page 107)

fifth prize.....$250

U. S. Savings Bond Plus Trophy
"PARADE" by John Rogers
Dallas, Texas (pages 108-109)

fifth prize.....$250

U. S. Savings Bond Plus Trophy
"SUMMER EVENING" by Antonio Migliori
Bologna, Italy (pages 110-111)

50 prizes U.S. Savings Bonds each.....$100

"Lightning," by William A. Barnes, Pembroke, Ga.; "Morocco," by Karl Bissinger, New York; "Jeanne," by Karl Bissinger, New York; "Truman Capote," by Karl Bissinger, New York; "Robert Russell Bennett," by Karl Bissinger, New York; "Central Park," by Karl Bissinger, New York; "Walking Cats," by Walter Chandoha, Huntington, N. Y.; "Semi-Nude," by Walter Chandoha, Huntington, N. Y.; "Good Appetite," by Otto Daettwyler, Menziken, Switzerland; "Quattro Soldi de Felicita," by Toni Del-Tin, Venice, Italy.

"Umbrella," by Ayao Emoto, Wakayama, Japan; "Cynthia," by Henry J. Fagliano, San Francisco; "Fencers," by Jack Fields, Belmont, Calif.; "Winter Scene," by Robert Folley, New York; "Kids," by Al Francekevich, Brooklyn, N. Y.; "Flying Home," by Michael J. Freeman, Hialeah, Fla.; "Yuriko," by Zachary Freyman, New York; "Dancer," by Zachary Freyman, New York; "Swirl," by Zachary Freyman, New York; "Choreography," by Zachary Freyman, New York.

"Snow Pattern," by John Gorman, San Francisco; "Summer," by Andre Guiete, Montpellier, France; *(Continued on page 204)*

All prizes in the 1955 Contest are awarded in the form of United States Savings Bonds, Series E, and are listed here in terms of their maturity value. Winners who are not citizens of the U. S., and hence are ineligible to own these bonds, are awarded cash in the amount of the purchase price of the bonds. Each prize is accompanied by an attractive Certificate of Merit.

The Kodak BULLETIN

Holiday Boxes &

—plus some immodest claims and vigorous talk about the unblushing Kodak Signet 35 Camera . . . the snap-feed, hopper-sorting, impeller-cooled projectors that now come in six combinations of wattage-lens-single-or-magazine-loading . . . the two-foot library of What Every Young Photographer Should Know . . . big roll-film color shots with the new high speed Kodak Ektachrome Film . . . and a very Merry Christmas!

Christmas rash

Last year at this time we said, "Never in all our born days have we broken out with such a rash of excellent camera outfits." Must have been contagious. They were so popular they made over two million people happy.

This year we've outdone ourselves—broken out in a bigger and better rash of outfits. They're the best answer we know to the Christmas shopping problem—the natural gifts for you to give.

Here's a quick rundown:

Any boy or girl would be given a good start on the most wonderful hobby of all with any one of these four flash outfits: the Brownie Holiday Flash Outfit, $9.75; the Brownie Hawkeye Flash Outfit, $14.35; the Brownie Bull's-Eye Flash Outfit, $18.60; and the Kodak Duaflex Flash Outfit, $21.75. All four contain camera, flash unit, flash bulbs, batteries, film and instruction booklet; all neatly boxed and gift wrapped. (If you want to go all out, there's the Kodak Duaflex De Luxe Flash Outfit for $31.95. It has the Duaflex Camera with a Kodar *f*/8 Lens, field case, flash unit, flash bulbs, batteries and film.) Duaflex outfits in *brown*, slightly higher.

For your wife, or a special friend, there are two more-advanced outfits: the Kodak Pony 135 Camera Outfit for

$49.65 (with the new Model C Pony with *f*/3.5 lens and 1/300 shutter) and the Kodak Town and Country Camera Outfit with the Kodak Bantam RF Camera for $65.45. Each includes field case and flash unit, in a really handsome package.

Then, for the ultimate in photographic giving (a gift you may well want for yourself), there is the Kodak Signet 35 Camera Outfit for $91.45 and the Kodak Stereo Outfit for $97.25. The Signet 35 Outfit includes camera, carry case, and flash unit. The Stereo Outfit includes the Kodak Stereo Camera and a Kodaslide Stereo Viewer I.

If, two days before Christmas, you haven't finished your shopping, don't say we didn't warn you. Go down to your Kodak dealer's while there's still some time left and look over the Kodak outfits he has on display. You'll get a good share of your shopping out of the way with one step.

No shrinking violet

When you have a winner, there's no point in false modesty. The Kodak Signet 35 Camera is a winner, and here's

what we're telling folks about it in photographic salon catalogs this year:

"The *Kodak Signet 35 Camera*, above, lists for $75. It is the only 35mm miniature camera on which you can get a *Lumenized f*/3.5 Kodak Ektar Lens. This lens is the peer in sharpness and color correction of any miniature-camera lens anywhere at any price.

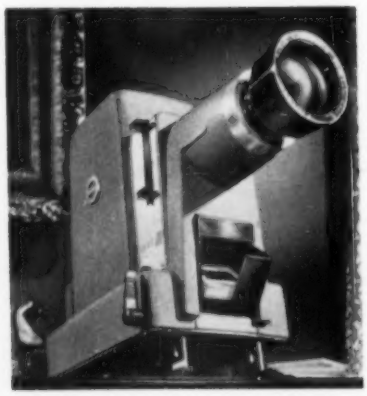
"To assure perfect performance from this superb lens, we put it in a lifetime-lubricated ball-bearing mount which is free from slackness and 'play,' and is velvet smooth in summer and winter.

"For further assurance, we combine the eye-level viewfinder with a clear-vision split-field lens-coupled rangefinder. And we build this rangefinder with special self-centering V-bearings which, like the lens mount, are free from all 'play,' assuring the utmost accuracy in ranging.

"Dollar for dollar, we regard the Signet 35 Camera as the best value in the whole miniature-camera field. You can spend more; you can buy more lens speed and gadgets; but you cannot buy finer lens quality in any miniature camera, *no matter how much you spend*. See your Kodak dealer, try a Signet, and find out for yourself."

Them's strong words, podner; but the Signet 35 has the stuff to back up every word, *all the way*.

Goat story



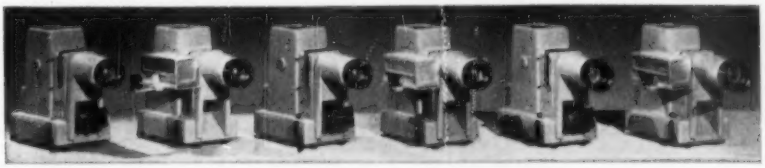
You've heard the story about the Vermont goats. They've lived so long on the hillsides that their legs are shorter on one side than on the other. Well, the Kodaslide Signet Projectors have the goats beat six ways running. For they not only have individually spring-loaded front legs to adjust themselves to hillsides or armchair arms; they put on a 2 x 2 slide show the like of which no Vermont goat has ever seen.

The Kodaslide Signet Projectors have lots of interesting features. There's a snap-action feed so fast you can hardly see the Grand Canyon change to the Grand Teton. A hopper hands you your slides back in original order. A recall lever brings back the slide you put in upside down or backwards, and a clearance lever drops the last slide out. The special impeller-type blower and extra-

Hot Molecules

thick heat-absorbing glass pamper your slides as nothing else can. And the close-coupled *Lumenized* condenser system puts more light on the screen than you'd believe possible.

The Kodaslide Signet 500 Projector, goat legs and all, costs $72.50 with an *f*/3.5 lens; $79.50 with an *f*/2.8 lens. The Kodaslide Signet 300 Projector is the same in most details except for a 300-watt bulb and less cooling requirements, and costs $59.50. Your Kodak dealer can show them to you. (Incidentally, you can have either the 300, or the 500 *f*/3.5 or *f*/2.8, with automatic slide changer at modest added cost.)



Molecular coat

Unlikely as it may seem, there's a connection between the *Lumenized* coating on Kodak lenses and the mirror-like *Lumaclad* finish on Kodak Flasholders. They're born in a hole in the air.

It works like this: when you heat a metal under ultra-high vacuum—about 1 billionth of atmospheric pressure—the metal doesn't just melt down into a puddle. It evaporates! If you put a piece of glass or plastic material in the vacuum

chamber, the metal condenses on the material to form a microscopically thin coating only a few molecules thick.

We use this technique to coat Kodak *Lumenized* lenses with just the right thickness of some material like sodium fluoride for exact optical characteristics. And the coating is firmly bonded to the glass to form a hard surface.

The same vacuum technique, using evaporated aluminum, puts the shiny surface on the reflectors of Kodak Lumaclad Flasholders. The surface doesn't tarnish, and reflects so well that it is ½ stop more efficient than old-style reflectors.

This vacuum coating is tricky business. The coatings must be absolutely even and just the right thickness. We helped pioneer the process years ago, and have been using it ever since. That's one reason why we're able to *Lumenize* relatively inexpensive lenses like the one on the $22.50 Kodak Duaflex Camera, *f*/8, as well as the Kodak Ektar Lens, *f*/3.5, on the $75 Kodak Signet 35 Camera. And that's why we're able to put Lumaclad reflectors on inexpensive Kodak Flasholders.

Two-foot shelf

Anybody who is serious about his avocation, whether it's archeology, astronomy, philately, photography, or what have you, knows the importance of having a good basic library of reference material on the subject.

Here's the list of books *we* think every *photographer* ought to have. How does it compare with what *you* have?

Kodak Reference Handbook, Volumes 1 and 2. Over 450 pages on Flash Technique; Kodak Lenses, Shutters and Portra Lenses; Kodak Films, Filters and Pola-Screens; Enlarging; Kodak Papers; Processing and Formulas; Copying. $4 for each volume.

Kodak Color Handbook. Has 248 pages including Color as Seen and Photographed, Color Photography Outdoors, Color Photography in the Studio, and Kodak Color Films. Over 100 full-color illustrations. $4.

Kodak Photographic Notebook. A loose-leaf file for new literature as it comes out, and for your own personal observations, notations, and data. $1.50.

Bigger and Better, the Book of Enlarging. 256 pages covering both the techni-

cal and esthetic aspects of enlarging. Reviews processes for making good pictures better, including dodging, flashing, toning, intensifying, etc. $2.95.

The Complete Book of Lighting. Discusses the nature, function, and correct use of light. Covers every phase of the subject including lighting for color and motion pictures. 256 pages, $2.95.

This is Photography. A basic text on all aspects of photography written in a highly entertaining manner. An excellent refresher and wonderful source for ideas. 260 pages, $2.75.

More color

Our new, fast, high-definition Kodak Ektachrome Film being available in 120 and 620 roll-film sizes has started a lot of people shooting big color who have only done black-and-white (or 35mm color) before. This new film in effect boosts your *f*/4.5 lens to about *f*/3.5, and takes your *f*/3.5 up to about *f*/2.

If you use a roll-film camera that takes 120 or 620 film, and has a good *f*/marked adjustable lens, try a few rolls of the new Ektachrome Film. You'll get some gorgeous transparencies under conditions you couldn't even attempt before. You can shoot big transparencies as easily as miniatures. And you can process the film yourself, or let your photofinisher do it for you.

Merry Christmas and good shooting!

Prices include Federal Tax where applicable and are subject to change without notice.

Kodak
TRADE MARK

EASTMAN KODAK COMPANY, Rochester 4, N. Y.

SAY
Merry Xmas
to everyone with
MARSHALL'S
PHOTO-OIL COLORS

FOR DAD
Painting is the relaxing hobby of presidents and prime ministers—why not for Dad? Even if he can't draw, he can paint, with Marshall's Photo-Oil Colors.

MASTER SET

FOR MOM
Remember Mom with a hobby that can make her extra money for the extras that all moms like to buy with their very own cash.

ACADEMY SET

FOR SIS
Give her a set of Photo-Oil Colors. It will boost her popularity score. She can be the artist of her crowd, coloring photos of herself, her family and her friends.

STUDENT SET

FOR JUNIOR
Who likes the Photo-Oil Color Pencils to color snaps of his pals . . . pictures of his favorite singers, cowboys, and pets.

PENCIL SET

APPROVED BY SANTA
who likes the moderately-priced gift that pleases young and old, suits the beginner yet is welcomed by the professional colorist. Santa likes the gift that pleases even the hard to please . . . or the "hard to buy for." He likes the gift that gives pleasure many days after the holidays are a memory. And colorful holiday memories can be kept alive . . . with Marshall's Photo-Oil Colors and Marshall's Photo-Oil Color Pencils.

MARSHALL'S
PHOTO-OIL COLORS
the colors the professionals use

☐ Send me your FREE booklet "Make Life More Colorful with MARSHALL'S PHOTO-OIL COLORS" . . . FREE
☐ MARSHALL'S PHOTO-OIL COLORING GUIDE Special section on Heavy Oils . . . $ .25
☐ Four different 5x7 photos, just right for coloring . . . $1.00
☐ THE STUDENT'S SET complete . . . $2.95
☐ THE PHOTO-OIL COLOR PENCIL SET complete . . . $4.75
☐ Our most popular set, THE ACADEMY complete . . . $5.40
☐ THE MASTER SET complete . . . $13.95
ALL TAXES PREPAID — MONEY-BACK GUARANTEE
C.O.D.'s welcome (send $1 deposit)
Name . . .
(Please print plainly)
Address . . .
City . . . Zone . . . State . . .
Photo Departments Everywhere or Mail Directly to JOHN G. MARSHALL Mfg. Co., Inc.
167 N. Ninth St., Brooklyn 11, New York PH-12

What You Need to Know About Electricity

(*Continued from page* 90)

Another example is the enlarger bulb—not the cold-light type—which usually has a special frosted coating inside to eliminate shadows from the bulb's filaments.

A variation of the filament bulb is the bayonet-based bulb used in slide- and motion-picture projectors and in most focusing spotlights. It is usually a slender glass tube with small lugs rather than screw threads on the metal base. It is designed to produce a concentrated light source and the lugs hold it in its socket solidly so vibrations will not jar it loose when the equipment is in use.

Heat, motion, and electronics

Electricity is used in three other ways in photography: to produce heat, to create motion, and to power electronic tubes.

Heating equipment such as print dryers and mounting presses again operate through resistance. As the electricity passes through the resistance unit of the equipment heat thus created is used for various purposes.

In motor-driven equipment such as motion-picture projectors and fans, the electricity passes through a coil of wire creating a magnetic field. This makes the motor rotate. The revolving motor in turn operates the equipment.

Finally, electricity is used to power the electronic tubes in tape recorders and in some types of print timers.

Wires and wiring

Insulated copper wire is the standard material used to conduct current in most photographic equipment. Its size is determined by the amount of current necessary to operate the equipment. The wires are of two types, solid and stranded. The solid is a single strand of wire. The stranded consists of a number of small flexible wires twisted together into a single cable. Both are covered by insulation.

The solid type is used primarily in building construction and for extremely heavy-duty cables for spider boxes designed for professional use. The stranded wire is used on almost all lighting equipment and other photographic apparatus. Its greater flexibility makes it less subject to breakage when equipment is moved around and cords are rolled and coiled for storage.

Wire sizes are determined by the particular job the equipment is supposed to do. General-purpose equipment using small amounts of electrical current, such as safelights, enlargers, timers, viewing lights, etc., will use either No. 18 or No. 16 wire.

Equipment requiring more current, such as flood- and spotlights, spider boxes, print dryers, and mounting presses, needs wires as large as No. 14 or even No. 12.

The higher the number of a wire, the smaller its actual diameter. A No. 18 wire is approximately $\frac{1}{32}$ inch in diameter while a No. 12 wire is slightly over $\frac{1}{16}$ inch thick.

All wires are covered by insulation to protect them from being broken and from short circuiting. It is of three types. 1—A lightweight solid-rubber or rubber-and-fabric covering for general-purpose equipment. 2—A heavy solid-rubber covering for wires carrying large amounts of current. 3—A three-layer insulation having a center covering of asbestos fibers to keep the heat generated in the wires from melting or burning the outer layer. This

(*Continued on page* 189)

Sheet Film and Film Pack

(*Continued from page* 82)

and others of hard rubber. Prices range all over the map from reasonable to expensive, depending on the size, material, and film capacity. All sheet or film-pack sizes can be accommodated by the correct choice of equipment, from 2¼x3¼ to 11x14 inches. Many are meant for sheet film only, some for film pack, and others are not only usable with both but are adjustable to a range of sizes as well. It is up to the prospective buyer to look them all over and decide which suits his needs and his pocket best.

Hard-rubber or stainless-steel open tanks can be purchased in all sizes to take one dozen or more stainless-steel hangers of the particular dimensions needed. They are fine for developing in total darkness, where the worker does not want to turn on the white light during this part of the cycle. Floating lids that are not meant to be light-tight, but rather to serve as anti-evaporation dust covers, are usually supplied. Hard-rubber open tanks are reasonable in price and will last forever, even with the worst treatment, but for each piece of sheet film to be developed at one session they require a separate, and costly, film hanger. They are not ordinarily used with film pack.

Another of the three popular types is the adjustable sheet or film-pack tank. These, too, come in varying sizes and prices, but because they are made of plastic and are complete as sold (including the adjustable rack) they are usually less costly. Some of them can be used to process both film types. The last worthy of mention is the daylight, top-loading type. Models are available that receive sheet film and film pack and that are adjustable over a size range from 2¼x3¼ to 4x5 inches.

Open tanks are best for permanent darkroom installations where the tank can be kept filled with developer on a round-the-clock basis. A tank is used for each step: developer, short stop, hypo, and wash water. The loaded film hangers are transferred to each succeeding tank as processing proceeds. More expensive models may be had with light-tight covers. Top processing speed is realized with this kind of setup, from the exposed film in the camera to the dried negative.

The other two types, purchasable in combined form (adjustable, daylight-type, top-loading and those able to receive sheet film and film pack) are used in the same manner as are roll-film tanks. The chemicals, not the films, are transferred through the light-trap top at the end of

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each cycle. These are more economical of solution and useful if the usual number of films to be put through is one dozen or less. One point should be stressed. Daylight tanks require loading in total darkness. Once the film has been inserted, the rest of the job can be done in daylight or with the white room light on.

Time and Temperature

No matter what kind of tank is used, it must be clean, free of dust or chemical deposits, and dry so that sheets of film will slip through the loading slots freely. All chemical preparations, including developer, stop bath, hypo, and water should be checked beforehand to proper temperature levels for the best possible results (around 68 F). A photographic timer, a thermometer, graduate, and any other tools contemplated for use should be assembled before starting to work.

All tank loading must be done in a photographically safe darkroom (i.e., total darkness). Therefore, the room to be used for processing should be checked to guarantee against light leaks by sitting in it with the doors closed and the lights out for at least five minutes. Any leaks noticed can be stopped up. If converting a normal room is a problem, such as a kitchen or bathroom, wait until nightfall to work when this task is somewhat simplified.

Sheet film is removed from the holders and stacked in a pile with the emulsion sides facing up. One at a time they are placed in the metal film hangers if an open tank is being used, or into the slots in the film cage of an adjustable or daylight tank. When the film is fully loaded the hangers (or the cage) are dropped gently into the tank. Open tanks will be filled with solutions all the time, so that on inserting the film it must be agitated and the time cycle started immediately.

The closed types can be loaded with solution through a light trap spout in the top cover and, therefore, filling can wait until the top is in place and the white light is turned on. Some people prefer to fill these all-purpose tanks with developer first, when the tank comes equipped with a cage removable as a unit, in which case insertion of the film marks the beginning of development. Loaded film cages or hangers must be eased gently into the solution to prevent sheets from popping out of their slots.

Film-pack loading differs from that of sheet film because the thinner base is more flexible and the design of the pack is more intricate in nature. Twelve sheets of film as pliant as the roll-film type are supplied in each film pack. In addition, each sheet has attached to it at one end a black separator sheet of protective paper and a pull-out tab to enable the film to be pulled away from the film plane, when the pack is in place in the camera, around a plate in the pack to a storage space in the rear of the magazines. Before and after use, the pack is protected against incidental exposure by extra paper tabs so that it can be removed from the film-pack holder and a fresh pack inserted without going into a darkroom to effect the change.

This intricate design raises the price of individual film-pack exposures over that of sheet film. The photographer pays for a metal box which becomes useless after one dozen shots. But many photographers prefer it because it eliminates bulk. It is not necessary to carry a suitcase-full of sheet-film holders, or the expensive sheet-film magazines, to shoot a few dozen pictures at one session.

Before developing, the film pack has to be disassembled so that only the film itself is placed in the processing tank. The detachable end of the box is removed in the darkroom and the film is lifted out. Single sheets can be removed for processing, if desired, and the pack reassembled to expose the rest of the film. An inexpensive paper cutter can be used to trim off the glued film-paper end, or the film and paper can be pulled apart by hand. Then the pieces of film, which are now separated from the paper pieces, are slid into the curved rack or cage of the film-pack tank. The slots of the film cage are crescent-shaped since the films gain rigidity when bent into this position (as they do when twisted around a reel in roll-film development) so that they will not fall out during agitation. For additional security some tanks have a retainer bar to insert at the top to hold the films in place. From this point developing proceeds exactly the same way as it does for the equivalent type of sheet film.

Earlier we noted that these larger-size films usually require substantially shorter developing times than roll and 35-mm films. This is traced to a more-active developer being used to bring up the larger image (among other reasons) without the increased graininess of the negative interfering with substantial enlargements from it.

Three of the developers that Kodak recommends for its sheet and film-pack types are DK-50, DK-60a, and dilute Dektol. Normal times in these solutions are as little as four to five and one half minutes. Ansco suggests its own formulas, such as Ansco 45 and 47, to name two, with developing times as low as four and one half minutes. All of these developers will give excellent results with the films suggested for their use. They are meant to be applied for press, commercial, and portrait photography. Of course, if the best possible grain pattern for the film under consideration is desired, for larger-size enlargements, then the slower-working fine-grain developers still can be used.

When more than one dozen sheets of either kind of film are to be developed at one time, the worker will be limited by the equipment he uses. The processing of large amounts of film is restricted by the capacity of the tank. Most adjustable or daylight tanks will hold no more than twelve sheets. If more than that amount is to be processed at one time, open tanks with up to a 36-sheet capacity (or more) are available and should be used. However, many of us will only occasionally run into this situation, and it would be an expensive luxury to so equip our darkrooms. After a completed processing cycle the tank can be rinsed in warm water, shaken free of loose droplets and dried so it can be used over again immediately for the next dozen sheets.

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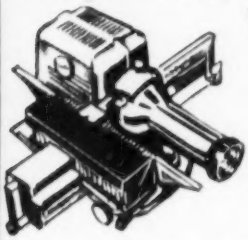

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Development of sheet film by tray is a common professional practice. All that is needed are the sheets of film and three trays for the solutions (available in all sizes in enamel, hard rubber, or stainless steel). The size of the developer tray should be at least four times that of the film, if possible. This enables the worker to manipulate his several sheets of film more easily than if the tray were just slightly larger. Therefore, an 8x10 tray can be used for film sizes up to 4x5 inches. Before feeding the films into the developer they should be presoaked in water so that they do not stick together. One at a time, they are placed in the sink water and gently agitated until all are thoroughly soaked. As soon as the last sheet has been immersed, the transfer to the developer is begun. They are removed from the water one at a time, allowed to drain for a few seconds to prevent dilution of the developer, and gently placed on the solution surface, then pushed below with the fingers. Be careful never to place the film in the developer end-first as the sharp edges will be certain to scratch the sheets already in the tray. The sheets are counted as they go into the tray. This is important. The first sheet should be the first one out, later on.

When all are inserted, the timer is turned on and agitation started. The first sheet of film is now on the bottom of the pile. It is brought to the top and the others follow, from bottom to top, until the cycle is completed. The numbers of consecutive sheets are continuously counted so that the position of number one is always known.

After the elapsed developing time, the number-one sheet is the first to be removed. It is transferred to the water rinse, and the others follow at about the same speed at which they were placed in the developer (five-second intervals). The films are rotated once, in the water, removed to the hypo one at a time, and the cycle is complete after at least 30 seconds of agitation there.

Since the hands are constantly in the developer, through the full time the film is in it, the temperature will rise considerably. It is best, then, to begin developing at a temperature below normal. In winter, 66 F; in summer, 65 F or less. By the time developing is finished, the temperature will have climbed above normal so that the mean temperature will be close to the desired 68 degrees. A check of temperature after development will aid in regulating the starting point.

Care must be taken in handling and holding sheet film. When presoaking, be sure that the film is wet down all at once. Do not pick up dry film with a wet hand. Once it has been wet down it can then be held with a wet hand without danger of damaging it. But hold it very gently, preferably by the edges, as the softened emulsion can be scratched or rubbed off easily. Always drain the film before moving to the next solution, and do not rush the transfer. Keep five-second intervals between the insertion and removal of each sheet. This will allow the job to be done relaxedly and comfortably, without unnecessary strain on the worker's part. Consider the limit to the number of sheets developed at one time to be one dozen. Six will be even easier to handle.

There are "old pro's" among us who often resort to tray development when they have a large number of sheet films to put through at one time. Perhaps because the capacity of their tanks is too small for the quantity of film at hand, or because they feel that it is less work to go through trays. It can work in the right hands, but is not recommended for all. Dexterity and long practice is required to pull off such a stunt well. First of all, the danger of scratching emulsion surfaces with sharp film ends and with fingernails is increased by developing many films in a tray. One dozen should be considered the limit.

Then, too, unless the films are presoaked in water they have a tendency to stick together on contact, and a large number is hard to juggle between a water-filled sink or tray and the developer. It is also necessary to count the films continuously so that the first one into the developer is the first one out. Since they are being agitated all the while it can become confusing when a lot are involved. The longer the hands are in the developer the greater the rise in bath temperature. Lastly, since a five-second delay between the insertion and removal of each sheet is a good idea to prevent haste and snarling, the total time for developing many films at once can be substantially increased.

Tank development is easier. When open tanks are used, the film is loaded into all the hangers and then inserted in the solution, as the clock is turned on. Agitation is necessary for the first 15 seconds so that air bells are stirred away from the emulsion surfaces. Then the film is allowed to sit in the developer for its normal time, making sure to agitate at least 15 seconds every minute if the bath being used will yield full development in about five minutes. If ten minutes or more is needed, five seconds of agitation every minute will be sufficient. Sometimes streaks in the image will occur, making it seem as if the negative were being viewed through a smeared window. This is the result of too little agitation when the negatives have been overexposed, and the metal hangers bear traces of silver deposits or other chemicals. The after-cure (nothing can be done to remedy the ruined film) is to clean the hangers by soaking in a dilute preparation of acetic acid for at least one hour, or more, and more diligent agitation in future work.

When using the daylight-type plastic tank the films (be they sheet or film pack) are inserted in the film cage and placed in the tank, with the light-tight lid secure. The white light is turned on and the measured amount of developer is poured in through the top spout. The whole tank is agitated by turning it over, or if special instructions are given by the particular manufacturer of the tank in use, they are followed (some have jimmy-rods protruding from the top cover by which to move the cage inside the tank). Times are the same as for above, the only difference being that when hangers are used they must be agitated by lifting out

of the developer, draining for a few seconds and re-inserting.

Upon completion of the proper time, the films are removed from the open tank and placed in the second one containing water or short stop. They are agitated for 30 seconds and then lifted out, allowed to drain, and lowered into the hypo, again being agitated for 30 seconds. Thereafter, five seconds agitation every minute will be enough until the 10-to-15-minute fixing time has run out. The white light can be turned on after three minutes.

When using the daylight tank, at the end of the developing time the solution is poured out of the tank and water or stop bath is poured in. Half a minute to one minute of agitation is given the film and the tank is again drained. The hypo is then poured in and after three minutes the cover can be removed and the job completed in normal room light.

Final washing can be given both types in the tanks. Once the hypo has been drained or the hangers removed from the open hypo tank, water is fed into another tank for washing or into the all-purpose kind, as the case may be. Keep the running-water temperature as near 68 F as possible, and wash all films for a minimum of 20 minutes in a full steady flow, to insure maximum preservation of the negative.

To dry, the films are taken out of the film cage and clipped to spring-type clothespins by a corner. If a wetting agent is used to soak the films for 30 seconds before they are hung up, they will not have to be sponged off. If not, cellulose, photographic-quality sponges, or moistened wads of cotton, are gently drawn down both sides of each sheet to pick up loose water drops. The same thing is done for sheet film that has been processed in stainless-steel hangers, but if a wetting agent is used for the final soak they can be hung up to dry in the hangers after shaking them thoroughly to rid them of loose water.

The Inspection Method

When the photographer has processed films by Time and Temperature for a while he may begin to feel some frustration. His exposures, taken under varying conditions of light (and lack of light) may all be good enough to yield satisfactory negatives if he were able to control the amount of development given each sheet. But he is developing them to one average time that has been calculated in advance from the ideal perfect exposure.

His results may be fine, if he's lucky, but many times some negatives will be off proper exposure. Inspection development allows a control that is lacking in Time and Temperature. It permits the photographer to adjust his developing time to correct for negatives that have been exposed too little or too long.

The equipment used for inspection work is in no way different from the ordinary. Many persons who work this way prefer to use trays rather than tanks since they will have to conduct the operation in total darkness, anyway, so that trays present no disadvantage in this respect. When less than one dozen sheets of film are involved, trays are excellent, the total time spent at work is reduced

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TO FIT CAMERAS OR LENSES LISTED BELOW	WALZ INDIVIDUAL FILTERS	WALZ FILTER KITS	WALZ CLOSE-UP LENSES	WALZ CLOSE-UP LENS KIT	WALZ LENS HOOD
Walz Filters are also available for most cameras with threaded lens mounts not listed	Colors Available: TYPE A TYPE F SKYLIGHT FLASH YELLOW RED GREEN	Color Kit Contains: TYPE A SKYLIGHT FLASH Black & White Kit Contains: YELLOW RED GREEN	Sizes Available: +1 +2 +3	Kit Contains: +1 +2 +3	SCREW-IN FOR ALL FILTERS AND LENSES BAYONET FOR ROLLEI
ARGUS C-3, Elmar f:3.5	1.95	5.75	2.50	6.95	1.95
RETINAS f:2 & 2.8, Karomat	2.95	8.75	3.50	9.95	2.95
CONTAFLEX, Contessa Contina, Ikonta 35	2.95	8.75	3.50	9.95	2.95
SIGNET, Bantam R.F. Cine Ektar f:1.9 & 2.8	2.95	8.75	3.50	9.95	2.95
ARGUS C-4, Ilioca Quick, Realist 35, Vito III	2.95	8.75	3.50	9.95	2.95
GRAPHIC "35"	2.95	8.75	3.50	9.95	2.95
ROLLEI: f:3.5 BAYONET	3.95	11.75	4.95	13.50	3.95
LEICA SUMMICRON f:2 Hektor f:1.9 & 4.5	3.95	11.75	4.95	13.50	3.95
LEICA SUMMITAR f:2 Steinheil Culminar f:2.8 & 4.5	3.95	11.75	4.95	13.50	6.95
CONTAX, Exacta, Exa, Praktiflex, Pentacon	3.95	11.75	4.95	13.50	3.95
CANON f:1.5, 1.8, 2.	3.95	11.75	4.95	13.50	3.95
NIKON f:1.4, Nikkor W.A. f:2.5 & 3.5, Nikkor Tele f:3.5	3.95	11.75	4.95	13.50	3.95

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Very compact. Clips onto camera accessory shoe. Collapsible ten blade fanfold. Adjustable reflector for flood or flash. 360 degree swivel for indirect lighting. Uses 22½ V B.C. Battery. Complete with leather carrying case.

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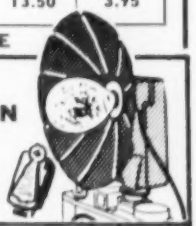

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Hasselblad 1000f

The 2¼ x 2¼ Hasselblad, the camera of the present as well as the future. No vexing parallax problems, interchangeable roll film magazines for 120 film, removable focusing hood, interchangeable lenses, patent preset diaphragm control, fool-proof shutter operation one sec. 1 - 1/1000 plus bulb and strobe. Ektar f/2.8 80mm preset or Zeiss Tessar f/2.8 80mm preset $379.50

LENSES:

250mm Sonnar f/5.6	299.50
135mm Sonnar f/3.5	285.00
60mm WA Distagon f/5.6 w/case	189.50
150mm Kilar f/3.5	119.95
300mm Kilar f/5.6	149.95
400mm Kilar f/5.6	239.95
Roll film magazine	69.00
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The Super-Wide Hasselblad. The camera that bursts through ordinary picture limits. With new 90° extreme wide angle 38mm f/4.5 Biogon lens $489.50

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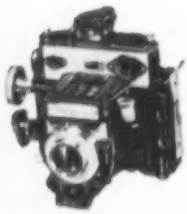

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Human engineered 2¼ x 2¼ press-type camera, gives 4 x 5 picture quality on inexpensive 120 roll film! Coated 90mm Omicron anastigmat f/3.5 lens. Oversize focusing mechanism, super-sensitive oversize magnifying range finder, auto-parallax correction. Rapax X sync **$239.50.** Rapax full sync **$258.50.**

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Omega D-2 w/Condensers — without Colorhead $173.50

Omega D-2 w/Colorhead and Condensers $183.50

Automega D-3 w/Omegalite $197.50

Automega D-3 w/Condensers — without Colorhead $207.50

Automega D-3 w/Colorhead and Condensers $217.50

2¼ x 2¼ to 5 x 7

Automega E-5 with Omegalite $272.50

Automega E-5 w/Colorhead and Condensers up to 4 x 5 $336.80

BROOKS 1st for Linhof

LINHOF 2¼ x 3¼ CAMERA—Complete 3 Lens Outfit Super Technika 2¼ x 3¼ Camera, 65 f/6.8 W. A. Angulon Lens, 105mm f/3.5 Schneider Xenar Normal Lens, 180mm f/5.5 Tele-Xenar Telephoto Lens. All in full synch. Compur Rapid Shutter to 1/500 sec. All lenses coupled to range-finder $569.90

Same as above, with 105mm f/2.8 Xenotar, W.A. and Tele-photo $663.70

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All Linhof features. With 100mm f/2.8 Planar, 53mm f/4.5 Biogon, 180mm f/4.8 Sonnar $1245.00

LINHOF 4 x 5 SUPER TECHNIKA

Multifocus Rangefinder — Tilting and Swinging Back — Revolving Back — Triple Extension Bed — Drop Bed — All Lenses Coupled to Rangefinder — And **NOW NEW UNIVERSAL BACK** and Exfalite Screen. (Accepts Polaroid, Grafmatic, and Roll Film Holders.)

4 x 5 LINHOF OUTFITS — Price below, includes camera with lenses (✔). With full synch. **MX Shutters up to 1/500 sec. Coated** — Other combinations on request

4 x 5	135mm f/3.8 Press Xenar	150mm f/4.5 Xenar	150mm f/2.8 Xenotar	90mm f/6.8 Angulon	240mm f/5.5 Tele Xenar	Price
One lens Outfits	✔					$429.70
		✔				$419.70
			✔			$629.25
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		✔		✔		$714.70
			✔	✔	✔	$645.60
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		✔		✔	✔	$845.15
			✔	✔	✔	

APO LANTHAR LENSES

105mm Lanthar MX f/4.5	$ 90.00
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65mm W.A. for 2¼ x 3¼ MX f/6.8	64.95
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127mm f/4.7 Xenar MX sync.	64.95
135mm f/3.8 Xenar MX sync.	99.95
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One of the world's greatest 35mm single-lens reflex cameras. With waist level finder.

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Exakta VX w/auto f/2.8 Tessar $279.50

AUTOMATIC LENSES

50mm f/2.8 Auto. Tessar	$100.00
50mm f/2.8 Westanar	69.50
50mm f/2 Westagon	110.00
50mm f/1.9 Xenon	169.50
58mm f/2 Biotar	164.50

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28mm f/3.5 Angenieux	$120.00
35mm f/2.5 Angenieux	99.50
Macro-Kilar 40mm Model D, foc. infinity to 2" f/3.5	$114.95
Model E, same as above, inf. to 4"	$89.95

TELEPHOTO

90mm f/2.5 Angenieux	$ 94.50
135mm f/2.5 Angenieux	179.50
135mm f/2.8 Pre-set Steinheil Quinar	$149.50
135mm f/3.5 Angenieux	89.50
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180mm f/5.5 Meyer Tele-Megor	$ 82.95
250mm f/5.5 Meyer Tele-Megor	$132.15
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300mm f/5.6 Kilar	$149.95
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Leica IIIF with f/2 Summicron	336.00

	M-3	Standard
35mm Summaron f/3.5	$ 99.00	$ 96.00
Fuji 35mm f/2 W.A.		199.00
Fuji 50mm f/1.2		369.50
50mm Elmar, ctd. f/3.5	80.00	57.00
50mm Summarit, f1.5	180.00	177.00
50mm Summicron f2	159.00	156.00
85mm Summarex, f/1.5, Chrome		360.00
90mm Elmar f/4, Chrome	93.00	90.00
90mm Elmar f/4, Collaps. mt.	150.00	
125mm Hektor, f/2.5		147.00
135mm Hektor, Chrm., f/4.5	141.00	135.00
135mm Hektor sht. mtd.	121.50	120.00
Leica Meter	30.00	17.50
200mm Telyt f/4.5		156.00
400mm Telyt, f/5		450.00
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Leica Flash Gun	19.50	24.00
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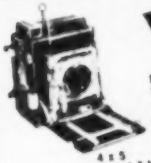
Stereo Outfit for Leica	297.00	294.00
Focomat Ic Enlarger w/o lens		$147.00
Valoy II Enlarger w/o lens		96.00



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w/150mm Tessar, f/3.5, Sync	295.00	339.00
w/150mm Xenar f/4.5 MX 1/400	249.50	284.50
w/150mm Xenar f/4.5 X sync. 1/200	293.45	347.45
w/152mm Ektar f/4.5 X sync. 1/200		347.45

4 x 5 w/127mm Xenar f/4.7 MX 1/400 Range Finder	$209.95	$249.50
2¼ x 3¼ w/105mm Color Scopar f/3.5 Kalart R.F. w/1/400 of sec. MX sync.	$199.50	$229.50

w/101mm Ektar f/4.5 MX 1/800	297.55	336.05
w/105mm Tessar, f/3.5, MX	245.00	289.00
w/101 Optar f/4.5 MX 1/400	278.85	318.35

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45 Graflmatic Film Holder for 4 x 5	24.95	19.95
Graflarger Stand	19.95	16.95
Graflarger up to 4 x 5	39.50	31.60

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Praktica FX f/1.9 preset Primoplan	$159.50	78.95
Flexaret Synch. f/3.5	99.50	48.95
Ditto Camera f/3.5	99.50	48.00
Rolleicord IV with f/3.5 lens		98.50
105mm Ditto Telephoto	39.50	29.95
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Boisey C reflex f/3.2 lens	89.50	48.50
Boisey B2 f/3.2 with case and flash	69.50	45.95
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Contax IIA f/2 X synch.	336.00	228.00
Contax IIIA f/1.5 X synch.	412.00	298.00
Super Ikonta A f/3.5 Tessar X synch.	99.00	69.00
Super Ikonta B f/2.8 Tessar X synch.	139.00	99.00
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Robot Star f/1.9 lens	249.00	109.00

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Medalist I, f/3.5	59.00
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Contax D w/f/2.8 preset Tessar	$94.95
Contax D w/f/2 preset Zeiss	$124.95
Eveready case	$ 12.00
Macro-Kilar 40mm Model D, foc. in. finity to 2" —f/3.5	$114.95
Model E, same as above, inf. to 4"	
135mm Albinar f/4.5	$29.95

PRAKTICA

Praktica FX f/1.9 preset Meyer	$78.95
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Case	8.95

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Now Cinemascope wide-screen 8mm and 16mm movies in your own home. Same lens goes on camera and projector. Takes and projects 50% wider pictures, saves 50% on film costs. Uses standard screen, film, exposure processing methods. Superb definition, clarity. No close-up distortion.

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35mm single lens reflex camera fully automatic preset aperture when shutter release. Zeiss Tessar f/2.8, lens speeds to 1/500 sec. and bulb. Double expr. prevention. Split image coupled rf.

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The only 16mm camera providing through-the-lens focusing and viewing during exposure, electric motor drive. Matte box, cables **$1650.00**

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BOLEX H-16 SUPREME

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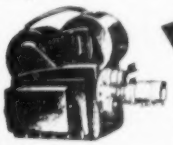

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Two filters are necessary to enable the photographer to inspect all "*color-blind*," *orthochromatic*, and *panchromatic* films, of which *Ansco Commercial* or *Kodak Commercial*, *Plenachrome* or *Verichrome*, and *Super-XX* or *Superpan Press* are typical examples, respectively. For color-blind and orthochromatic types a red safelight filter is used, since they are not sensitive to red light—they behave as if light of that color does not exist. The other type, panchromatic, must be inspected with a dark-green filter and though the worker can leave this light on long enough to see the condition of his films, they are not really insensitive to the light. He must, therefore, exercise some care in using the green safelight for it can fog his film, if the bulb used in the lamp is too strong or the film is exposed to it for too long a time. Either color filter will fog film if damaged, but if properly sealed into the safelight and in good condition, it will do the required job.

When films are being developed that are blind to red, a Wratten Series 2 (dark-red) filter is placed in the safelamp at a distance of three feet above the developing tank or tray. It is directed downward and slightly away from the line of vision so that the worker will not be looking into the light. The red light permits orthochromatic and color-blind films to be processed under its glow from start to finish, but most people prefer to leave it off, to develop in darkness until half the normal time has passed. The reason is, simply, that they are surer no accidents can happen to fog the film when they are working in total darkness Then, at the halfway mark, the lamp is turned on and the films are held up to its glow to determine how well the images are emerging. If all appears to be normal, the remaining development is given them, as usual, and the safelight is forgotten.

For panchromatic film, a Wratten Series 3 (dark-green) safelight filter is installed. Here, it is necessary to load tanks or trays and develop to the halfway mark, in total darkness, irrespective of choice. Though the Series 3 filter is the best one devised for inspecting pan film, it can fog the film if it is turned on too soon or left on too long.

All manufacturers of pan film recommend using the safelight for only a few seconds at the proper distance from the film with the correct bulb supplying the illumination (usually 10-15 watts). But in practice most people are successful if they follow the simple rule of not permitting the inspection light to expose the film for longer periods than absolutely necessary, up to a maximum of about five percent of the total specified developing time.

With a developing time of six minutes this would work out to about 20 seconds of viewing time for each sheet of film. With longer processing times of 16 or more minutes, 45 seconds or more will be permissible though the films are never exposed any longer than necessary to determine their progress.

The light given off by a safelight with either filter installed will be dim. To the new user it will seem so dim that he will think it impossible to judge anything in that light. As the eyes become adjusted to the low-level illumination, after stepping into the room, he will be able to see better, until after some minutes (five or more) he can begin to work. He is careful never to start work immediately after coming into the darkroom from a very bright place, since it takes time to adjust for what flyers call "night vision": the ability to see as well as possible in near darkness.

Even when the eyes have adjusted the worker will not have very much light to inspect by. With many workers the green safelight is poorer in this respect than the red, which casts a satisfactory glow. The whole idea is to look at the film without damaging it, but even though these filters have been designed as perfectly as possible, there is still danger of fogging *if the level of illumination rises too high*, since incident light rays of other than the wished-for color will trickle through the filter when too powerful a bulb is used.

Learning to "read" film under the safelight is the big trick in inspection development. It is not enough to be able to see under this dim light, but what is seen must be properly interpreted. What should a negative look like when it is normally exposed and ready to be removed from the developer? This is no easy question to answer, since it depends on several factors.

The type of lighting used to expose the negative can affect its appearance under the inspection light. Outdoor scenes are perhaps the easiest to judge because there is usually a good range of contrasts from highlights to shadows which show up as light and dark gradations. Indoor illumination, such as normal room lighting, is no harder since it also casts shadows in imitation of sunlight. But on-camera flash and floodlighting which was set to reduce shadow in the subject will appear as a much more solid mass of black under the safelight, without any "open" or shadow areas. One rule can be stated as a result of the above. A normal outdoor exposure will usually show on the sheet of film as masses of heavy black and almost clear white, while evenly lit subjects will appear heavier and more solidly black.

The weight of the film base will also affect its appearance when viewed by an inspection light. The heavier the base the more opaque will the image appear to the eye. Therefore, film pack, with its thickness comparable to roll film, will give the impression of a more translucent deposit. The observer almost has the feeling that he can see through the negative (which is not transparent at this point, but

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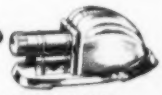

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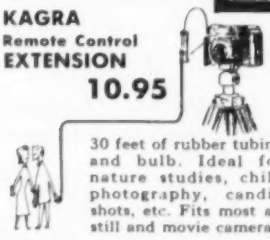

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opaque). Sheet film, with the heavier base, will show up blacker. When the image is no more dense than an identical negative shot on film pack it will appear much more so under the safelight.

Size has a direct bearing on ease of judging a negative's progress. The smaller the negative the more compressed are the details of the picture and therefore the harder it is to estimate properly. Big films have an advantage over roll films to the worker developing by inspection, because of this fact. The larger the negative the easier it becomes to make out details of the scene under the red or green safelight, simplifying the task.

Another factor can be the film type used. Some films are designed to yield hard (or soft) contrast negatives and therefore will appear blacker (or more gray) when they have been developed to normal density. Developers can also alter looks somewhat depending on the harshness or gentleness of their action. Usually, fine-grain formulas will yield softer images, which are slightly more gray, than will those designed to produce full film speed.

Finally and perhaps the most important of all, the distance the film is habitually held from the safelight will give to the viewer a range of impressions, depending on how far this distance is. Manufacturers caution all concerned to keep film at least three feet from the safelight when inspecting, although many people with considerable experience at working in darkrooms couldn't judge their results at this length if their lives were to depend on it. Most violate this rule without ill effect. The closer to the safelight the film is moved the brighter the illumination is at its surface. Just below the filter it is almost as easy to judge the density of the image as it is in normal room light. But when this is done with pan film under a green safelight the total time permissible for viewing should be reduced to as little as is absolutely necessary, to prevent fogging. Chances are that if the five-percent rule is followed, this action will increase the total light level enough to cause some fog.

The photographer getting set to develop by inspection for the first time may not have the faintest idea of what to look for. This is not unusual since most learn from experience. The best way to get the experience without fouling up a job is to develop for the first few times under controlled conditions.

Expose some film, using an exposure meter to guarantee normal lighting. Then set up for inspection development and at the proper temperature, develop to the given time for the formula being used, making sure to inspect at frequent intervals so that the proper appearance of the image can be seen and memorized at every stage of its progress. Do this with outdoor scenes, with flash and flood, with all kinds of pictures and lighting situations Soon inspection technique will become second nature and the day will inevitably arrive when some very important shots will be saved by catching the error of commission during development and correcting it—just because the inspection light was used.—

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250mm f5.5 Meyer Goerlitz Tele-Megor	132.15	74.00
300mm f4 Carl Zeiss Sonnar pre set	495.00	265.00
300mm f5.5 Schneider Tele-Xenar	139.95	69.00
300mm f5 Astro Telephoto Lens	195.00	115.00
300mm f3.5 T.V. Feroliose Telegon	260.00	195.00
300mm f5.6 Kilfit Tele-Kilar w/adaptor	161.95	99.00
360mm f5.5 Schneider Tele-Xenar	169.95	98.00
360mm f5.5 Novoflex	149.50	69.00
400mm f4.5 T.V. Feroliose Telegon	260.00	195.00
400mm f5 Astro	245.00	149.00
400mm f5.5 Meyer Goerlitz Tele Megor	199.50	99.00
400mm f5.6 Kilfit Fern-Kilar w/adaptor	251.95	149.95
500mm f5 T.V. Feroliose Telegon	450.00	260.00
500mm f5 Astro Fernbild Telephoto lens	395.00	235.00
500mm f8 Carl Zeiss Telephoto lens	475.00	185.00
600mm f5 T.V. Feroliose Telegon	565.00	295.00
604mm f5 Astro Fernbild Telephoto lens	725.00	310.00
800mm f6.3 T.V. Feroliose Telegon	750.00	350.00
800mm f5 Astro Fernbild Telephoto lens	895.00	450.00
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21mm f4.5 Biogon	249.00	149.50
28mm f8 Carl Zeiss Tessar		55.00
28mm f3.5 Nikkor	149.50	89.50
35mm f2.8 Carl Zeiss Bioneter	182.00	89.50
35mm f2.8 Carl Zeiss Biogon	182.00	115.00
35mm f2.8 Carl Zeiss Biogon	265.00	99.50
35mm f2.5 Nikkor	139.50	85.00
35mm f3.5 Planar	102.00	64.00
35mm f3.5 Nikkor	89.50	50.00
50mm f2 Carl Zeiss Sonnar	146.00	60.00
50mm f1.5 Carl Zeiss Sonnar	171.00	90.00
50mm f2 Nikkor	125.00	65.00
50mm f3.5 Carl Zeiss Tessar	169.50	105.00
50mm f1.1 Zunow	450.00	225.00
50mm f3.5 Carl Zeiss Tessar	62.00	34.50
50mm f1.5 Carl Zeiss Sonnar	188.00	90.00
75mm f1.5 Carl Zeiss Biotar	465.00	175.00
85mm f2 Carl Zeiss Sonnar	329.00	119.00
85mm f4 Carl Zeiss Triotar	106.00	55.00
85mm f2 Nikkor	175.00	98.50
85mm f1.5 Nikkor	299.50	175.00
90mm f3.5 Kilfit Kilar	74.95	42.50
105mm f2.5 Nikkor	152.50	90.00
125mm f2.3 Astro Telephoto	195.00	115.00
135mm f3.8 Kilfit Kilar Basic	89.95	55.00
135mm f3.5 Nikkor	135.00	75.00
135mm f4 Carl Zeiss Sonnar	146.00	99.50
150mm f2.3 Astro Telephoto	275.00	185.00
150mm f1.8 Astro Telephoto	495.00	275.00
150mm f3.5 Kilfit Kilar Basic	119.95	75.00
180mm f2.8 Carl Zeiss Sonnar	720.00	340.00
250mm f4 Nikkor w/Refl. Housing	236.00	
300mm f4 Carl Zeiss Sonnar	850.00	450.00
300mm f5.6 Kilfit Kilar Basic	149.95	
300mm f4 Carl Zeiss Sonnar		
300mm f5 Astro Telephoto	195.00	
400mm f5 Astro Telephoto	245.00	
400mm f5.6 Kilfit Kilar Basic	229.95	
500mm f5 Astro Telephoto	345.00	
500mm f8 Carl Zeiss Telephoto	825.00	
600mm f5 Astro Telephoto	695.00	
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1000mm f6.3 Astro Telephoto	1350.00	

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Contax IIIA f1.5 Sonnar	412.00	189.95
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Leica IIIF f2 Summicron	336.00	172.50
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Revere 444 300 Watt	69.50	29.00
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George Silk

(*Continued from page* 88)

morning. "I can make it, sir," he told Australia's top official, "if you'll lend me five pounds." The Prime Minister had a noteworthy intuition. George got his fare and soon found himself in the Middle East trying to master a 4x5 press camera.

"I just hadn't the touch for it," he says. "My whole training had been with light, mobile equipment, and my creative reflexes rebelled." In Palestine he bought a Rolleiflex and a Contax with 50-mm and 180-mm lenses. Then came battle.

George Silk was among the first of the combat photographers to use small cameras in the facile ways for which they have now become renowned. In fact he was so far ahead of his associates that for two years the Australian Ministry of Information never printed any of his pictures because they were certain that such tiny negatives would produce no images worth using.

"I shot a whole batch of sea battles at night with star shells and flying flack, the kind of thing a magazine today would use for a six-page lead—and they were never even proofed back home. Finally I decided to send some pictures directly to the British Ministry of Information in New York. I didn't know then that they were in Rockefeller Center near *Life*, but pretty soon *Life* came out with some of my war stuff."

George shot war action in Greece, Tobruk, Crete, four major campaigns, and Syria. Returning to Sydney, he was about to be fired because of Ministry politics, but "They never canned me," he laughs. "I took off for someplace." Such as New Guinea, where he followed a Japanese retreat, got malaria and dysentery, lost 42 pounds, and spent three months on foot, until they had to carry him out on a stretcher and a plane.

It was 1943 when a Silk photograph made Picture of the Week in *Life*, became a U. S. warbond-drive poster, and stirred up enough intra-Australian-Army fuss to start George on his way to a magazine photographer's career. This simple shot showed a blinded and bandaged soldier being led over a jungle trail by a sympathetic Papuan native. On the strength of this shot and some others, Wilson Hicks of *Life* offered George a job which he accepted from his hospital bed, where he was recovering from the New Guinea ordeal.

Thus the end of 1943 found George in New York, where he spent three and a half months getting used to his new job, a new country, and the prospects of a bright, exciting future. By this time he was a small-camera expert, specializing in long-focal-length lenses which enabled him to move in on action and danger visually without making himself quite as easy a target. He usually carried two Contaxes fitted with the 180-mm and the 50-mm lenses. Focal lengths today are even longer, and George often finds himself with a 300-, 400-, or 600-mm lens mounted on a Nikon or Pentacon, firing away at a news or sports event. In this way he covered the 1954 British Empire

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Games perched on the roof of the grandstand, shooting runners 600 feet away and filling the whole 35-mm frame.

For his first *Life* staff work George went to Italy and more war. Then came the invasion of Southern France when he landed in a glider which cracked up and damaged a couple of his ribs. To make matters worse, none of his exciting pictures were used because that week Paris fell and *Life* ran that as a lead story.

After another stint in New York, this time in a hospital, George joined the British in Northern Europe, stayed with them until they hit Cologne, where he was wounded in the leg. It happened during the Roer River crossing, when he high-tailed it over a narrow bridge and stopped to photograph the soldier behind him, who had been killed a second before. So back he went to the hospital.

Silk stopped to record the death of the man behind him, as troops rushed across a pontoon bridge on the Roer River during World War II.

Next came the war in the Pacific where he replaced Gene Smith who had been shot up on Okinawa in the course of extraordinary duty. The war ended soon after and George talked the Air Force into flying him in a B-29 over the ruins of Japan—during which he got a first-look scoop that merely added to his unheralded prestige around the office in New York. Knowing that Silk had a large store of intestinal fortitude, his editors sent him on to China, then a country hardpressed between war and revolution.

It was in China that George was nearly liquidated and never knew it. He was taking a picture of a well-fed rice merchant's wife grinning into the lens while next to her a starving boy begged for a bowl of rice amid the merchant's rice stocks. George never noticed three Nationalist soldiers behind him as he shot. None of the crowd made a murmur as the soldiers prepared to blow his head off for taking pictures they didn't approve. In the proverbial nick of time a multi-lingual American woman from UNRRA talked them out of it. "My knees shook

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later when she told me how close I'd come," he remembers.

Thus almost half of George Silk's photographic life has been spent in war or its aftermath. Stories with an element of danger became familiar to him almost from the day he left the camera store. He has not run around asking for the tough ones, and *Life* editors never force a job onto their valuable photographers. Fighting the elements is just a natural outgrowth of Silk's character and experience.

In the midst of his accounts of Polar trips and combat risks I asked George how it was that he had tackled so many hair-raising jobs. He is a modest man with a sprightly young wife (whom he met on a Vermont ski lift) and three youngsters. He remembers things factually even when they were very dramatic.

"I've just carried on the way I lived as a kid," he explains. "The rougher it blew, the better I liked sailing. I used to read books on climbing Mt. Everest and I'm still not over the disappointment of not having been there with Hillary, with whom I went to school in New Zealand. As a kid I hankered to go on a Polar expedition, and I longed to see the rugged land of Labrador. I never asked for the Labrador missionary story—it just happened on me. The tough assignments are just part of doing my job."

Silk's first trip to the North Pole held the "scariest" moments of his life as well as being his toughest job. It was 1950 and he accompanied an Air Force party led by Col. Joe Fletcher to establish a weather station on an ice island 98 miles from the Pole. Since nobody knew if a ski-equipped plane could land on the snow-covered ice, for 45 heart-in-mouth minutes they bumped the skis on the snow and zoomed up into the frigid air again.

"If anything had gone wrong," recalls George, "there was no chance for survival. At last the pilot decided to set it down, and the surface held. We spent five hours there and I managed to take two and one half rolls of 120 film in the 72°-below-zero cold. I could only make one picture at a time. Then I'd slip the Rollei back under my parka to warm it up to about 30° below so it would work again. Between times I helped them unload the plane.

Shooting in such chilly conditions is full of terrific mental problems, according to Silk. Your reflexes are slowed. Cameras can be winterized to make them functional at 30-40° below zero, but there is always the risk that something will stick. On his second trip George used a brand new Nikon, for he had discovered that factory-fresh equipment doesn't have to be winterized, but will withstand very low temperatures as is. Just why this is, he doesn't know, except that perhaps the lubricants are still too fresh to become gummy.

Even before he covered the Polar expedition, George spent two months of 1953 in Labrador, where he finally got to see that rugged land as it is administered to by medical missionaries. On a 70-foot boat they were navigating a deep sea

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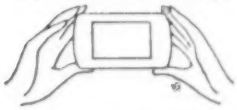

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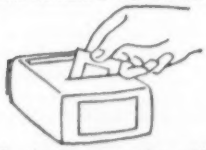

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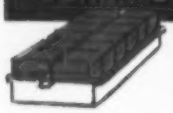

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channel when the wind blew up at 125 mph, enough to break the wind register. They made a run for a small cove, where that night they tied up until the lines broke and the ship floundered in the waves. George made some salty and exciting shots there and pitched in to help save the ship—a home to these hardy men of medicine.

Needless to say, George Silk travels as lightly as possible on his challenging stories. Two Nikons and two Rolleiflexes, with a set of four lenses for the 35-mm cameras, comprise the full kit. In a tight spot indoors he often replaces ordinary light bulbs with #1 photofloods, which are 250 watts each and serve very well in dim-light situations. *Life* provides Super-XX film, which is developed in Microdol or D-76 as conditions require more speed.

"If you can see it, you can photograph it, I like to think," says George. "Too many people worry about grain or needle sharpness. I worry about getting the essential elements of the picture, the impact I'm aiming for to get the story across. When people may ask me for hints on photography, I tell them to go out and shoot and get the experience of mistakes as well as triumphs."

Luckily, the average amateur doesn't have to keep his shooting wits about him in as unusual conditions as Silk once had to in the Canadian Rockies. He was doing a story on the building of a pipeline which was going so slowly over the rugged terrain that they called it the "Big Inch by Inch." On the first morning he made the trip up to the construction site on a tiny car called a railroad speeder.

"That route reached a high point," as George tells it, "where a single track is laid on a ledge 3000 feet high, overlooking a sheer drop of 2000 feet. We rounded a sharp curve and there coming toward us across a 250-foot wooden trestle was another speeder, also doing about 30 mph. I never thought we'd stop and with some other guys I dived off into the dirt, slid on my face, and stopped with my nose just over the precipice. The two cars stopped inches apart.

"I rode that blasted car every day for three weeks after that, and I was always scared. Much worse than when I was actually out shooting."

George gives credit for a lot of encouragement and important influence to Wilson Hicks, Editor of *Life* for many years. "Hicks once told me," said George, "'Your forte is man against the elements, and you should stick to it.' That counsel has really meant something to me when the going was rough."

George Silk is lucky as well as smart. He has often been frightened in a strange atmosphere where the elements of the unknown were trying to neutralize his photographic instincts. But the drive that propels him behind the camera, to think of his compositions automatically, to keep up with events—this energy defeats fear.

Not long ago George faced a story situation that looked hopeless, it was so physically and mentally tough. Near Santa Barbara, California, the Bureau of Reclamation is digging a tunnel into which hot water flows like a river. With the workers he rode into the tunnel immersed to the neck in a water-filled dump cart, after conditioning his Nikon in a hot box to 120 F so it wouldn't fog. Using some flash which often went off unexpectedly as the dripping water shorted the circuits, and shooting by the light of miners' helmets, he got his coverage.

The film reticulated in the camera on some shots, but there were still enough

George Silk himself, when he was attached to the Australian Army in New Guinea in 1943. The Contax was equipped with a 180-mm lens.

pictures on his one roll to tell the story. There was no chance to change film inside the tunnel.

"We spent five hours in there among those soaked workmen in 112° air and 100-percent humidity. I knew one thing: I'd have to throw the camera away. That water was so corrosive with minerals that it ruined it for further use."

Life hasn't been completely a bowl of cactus and thorns for George, despite the tough times. Working first out of Manhattan, and since 1951 from the Los Angeles office, he has pulled down a few pleasant jobs, too. Like the weeks he spent watching Rosemary Clooney and a batch of other cuties making a movie called "Red Garters." Or the day when he took Terry Moore to the beach and shot her roughing it up with Robert Wagner. Then there was the fun of an animal show in 1952; backstage at a nightclub with beauteous Linda Lombard; and numerous jaunts to Hawaii for various subjects.

Not long ago George was having breakfast in his kitchen with his family when six-year-old Stuart noticed that one of the pushpins had fallen out of the world map on the wall. There was a pin for each of the places Daddy had worked. "Where'll we put it?" asked his little sister. Stuart jammed it smack into the North Pole and said, "You'll probably be back there any time now."

As long as rough duty is challenging to George Silk, his son may not be so very far from wrong.—

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Two outstanding amateurs try a

low-cost sound

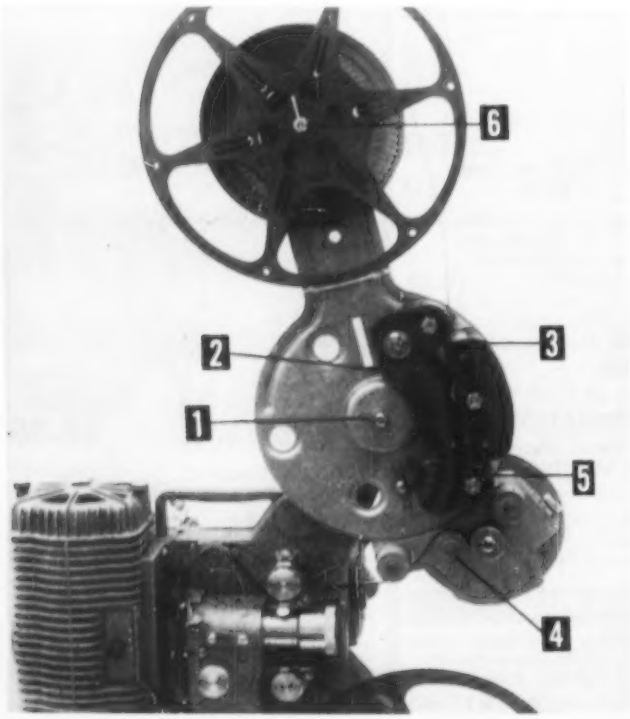
To the average person going to the movies, the spoken dialogue and musical background are an accepted part of the picture. Without them, the man who paid his admission to be entertained for a couple of hours would feel he had been cheated. Sound is an expected part of any movie coming out of Hollywood, and more and more it is an expected and accepted part of any movie produced by the amateur for showing to his own friends and family.

Until now, however, sound for the average amateur has been almost out of the question because of the complexities and costs. It is only recently that an adapter unit has been put on the market which not only simplifies putting sound on movie film but also brings the cost within reach of the amateur.

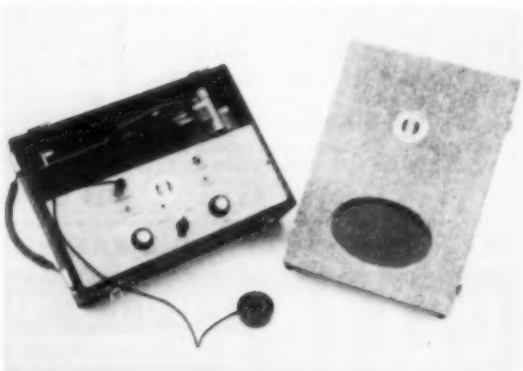
It is called Cinesone, a magnetic-sound adapter that converts any silent projector that is capable of handling 400-foot reels. Its cost is only $99.50 for either the 8-mm or 16-mm version.

Cinesone is made up of four parts. The sound adapter which is attached to the projector, an amplifier, a speaker, and a directional microphone.

In order to get a clear picture of the operation of the unit and what results could be expected from it, two well-known amateur movie makers, who have been using the Cinesone adapter in their own work were asked to tell their stories to POPULAR PHOTOGRAPHY *readers. They are Mr. J. F. Hollywood, a founding member of the New York City 8-mm Motion Picture Club; and Mr. Bert Seckendorf, past president of the Brooklyn Amateur Cine Club. Mr. Hollywood works exclusively in 8-mm, while Mr. Seckendorf shoots the major part of his pictures in 16-mm color. Here are their reports.*



1 Cinesone fits on feed spindle where film reel was formerly placed. It can be used on any projector that accepts a 400-ft reel. **2** Sound head which records and also plays back tape. **3** Automatic subduing switch for use in putting on background music. **4** Jockey roller which compensates for any unevenness in projector speed. **5** Attachment plug which takes cable from amplifier unit. **6** New feed spindle for the film. Projector used here is a Keystone 8-mm silent model.



Cinesone outfit is packed into carrying-case-type unit. It consists of sound head, speaker, amplifier, directional microphone.

system

By BERT SECKENDORF, Brooklyn Amateur Cine Club
As told to HARVEY SHAMAN

I'VE been working with sound for 8-mm and 16-mm motion pictures for a number of years, and have tried practically all the methods which have been available; records, wire, and tape. The only one I haven't used was optical sound stripe directly on the film, which I felt was too costly and complicated for the results obtained. All of these methods, however, have been lacking.

It is only within the past three or four years that a practical method of putting sound on film has been available to the amateur worker.

This is the magnetic-sound stripe, which is simply a miniature tape recording attached directly to the edge of the film. It insures perfect synchronization between the sound and the picture and produces an extremely high-quality sound when compared with the results obtained with either optical sound or wire recordings. It too, however, was too expensive and complicated for the average amateur to use for his film. (*Continued on page* 181)

By J. F. HOLLYWOOD, New York City 8-MM Motion Picture Club
As told to HARVEY SHAMAN

ALTHOUGH I don't consider myself a technical expert, I've been using sound with my 8-mm movies for a number of years. As a non-expert I always call in two fellow members of the New York City 8-mm Motion Picture Club to assist me when I decide on sound for one of my pictures. They are Archie MacGregor, who has a fine sense of mood and tempo, and John Hefele, an electrical engineer who stands by for advice and guidance on technical matters.

In the past, we've worked with music from records played from a double-turntable player while the picture was being projected. More recently, we've recorded on tape, both regular and synchro, but we've always found there was something missing.

When Cinesone offered moderately priced sound on 8-mm film, we were definitely interested. It seemed that our days of trying to keep sound and sight in step were over.

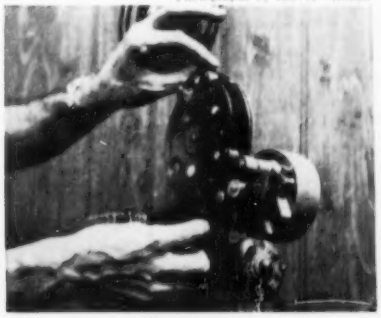
For our test, I had a 300-foot 8-mm Kodachrome film magnetically striped. MacGregor (*Continued on page* 182)

Bert Seckendorf shows how to set up and use Cinesone

Photographs by Harvey Shaman

Unit is unpacked . . .

sound head goes on projector . . .



film is threaded through unit . . .

sound level is adjusted . . .

music is dubbed in first . . .

voice goes over the music.

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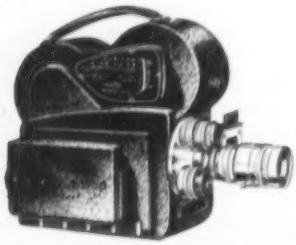

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Fundamental camera techniques

CCNY MOVIE SHORT COURSE—Part 2

By ARNOLD EAGLE
Instructor, Fundamental Film Techniques, College of the City of New York

The second in a series of four "lectures" by instructors at CCNY Institute of Film Techniques.

IT ALWAYS amazes me that intelligent people can spend hundreds of dollars on equipment, and a great deal of effort and time, without attempting to find out a few fundamental principles of motion-picture technique which would not only improve their films immensely, but would make them enjoyable for the viewer. This is especially true, I find, among my students who have had some experience in still photography. Although it is true that the still photographer has a great many advantages over someone with no camera experience whatsoever, such as his knowledge of exposure, lighting, and composition, still and all he will make just about the same amount of cinematic mistakes as the latter. Here are some of the most glaring errors that a beginner makes:

Excess panning. Although panning is a very important cinematic technique, it has a very specific and limited function in film making. It is easy to understand how a still photographer feels who has been frustrated all his life by being chained to a single frame, and who, if he wanted to include more of his subject in his picture either had to move back or use a wide-angle lens (which distorted his perspective), when suddenly he finds himself behind a camera which needs only to be panned to include everything his eye sees. By excessive panning the amateur movie maker is committing a few very serious fundamental errors. First he must understand that cinematic movement is not caused by panning or by having his subject move in the frame. Movement in motion pictures is caused by the juxtaposition of different images and views, and by the rhythm and the length of each cut in the film. Panning itself must have a specific function, such as introducing and discovering a scene for the viewer, especially if the camera discovers or reveals a scene which has an added interest or surprise. Aimless panning that starts nowhere and ends nowhere will usually find its place on the cutting-room floor when an experienced editor edits the film.

A pan is also functional when a subject is moving from one location to another and the camera should logically follow it. One of the great drawbacks of a pan is that the film cannot be cut while the camera is in motion. We mentioned before that movement in a film depends a great deal on the length of each cut, establishing a rhythm for the film; a pan may not fit into the rhythm at all

Photographs by Alan H. Pesetsky

Students prepare to shoot scene during a workshop session at CCNY Film Institute. They learn fundamentals thoroughly before shooting on projects.

when it is too long. In all cases it is a good practice, if you have the urge to pan, to stay still long enough before starting the pan and immediately after the pan, so that if the pan itself must be cut out, the entire shot will not have been lost. Whenever possible, a pan should be practiced on a dry run to be sure that the cameraman will know exactly where to begin, where to end, and, if he is following a subject, that it is continually in his frame. This is quite a difficult operation, and you need a certain amount of experience to carry it out smoothly. Under no circumstances can you pan too far and then try to "back up." You cannot go around searching for the subject. Frequently a cameraman would be much better off making two or three shots of his subject rather than a pan shot, since the former can be edited far better than the latter.

Use of a tripod. This is another sore point. I cannot emphasize strongly enough the fact that there is no cameraman, no matter how experienced, who can hold a camera steady on a still object without the framelines bobbing up and down, causing seasickness in his unsuspecting captive audience. Naturally under certain circumstances, as for instance, documentary shooting, when there is no time to set up a tripod, or a tripod would be too conspicuous, thereby spoiling the shot, a cameraman would be justified in using a camera without a tripod. Under such circumstances, however, it will help him if the subject is moving and he is following it in his viewfinder. In a moving frame it is possible to get an apparently steady picture without the audience being conscious of the bobbing of the frame. Also, for certain subjects, such as sports, having a free camera without a tripod is a useful technique. But at all other times a good, steady, motion-picture tripod is a must. The tripod should have a smooth panhead with a double control so that it can be locked separately for horizontal or vertical movement. Otherwise a pan will start on one level and end up on another.

Lack of close-ups. This is a third very great error most beginners make. Most of his film is usually made up of long shots and a few medium shots. A close-up, besides being important in editing for "cut-away" use, is the soul of motion-picture photography. It is in close-ups that the viewer has a chance to identify himself with the subject, and to examine the subject in a way that no other medium can make possible. It is the close-up that gives motion-picture photography one of its greatest advantages.

One more point I would like to make is that whenever you change the view from a long shot to a medium shot to a close-up, or change the angle of the distance from the subject, the change should be quite drastic. When two pictures follow each other, a slight change only confuses the viewer and results in a jump cut, or else it looks as if there was a slight break in the film, and the viewer is not made conscious of the fact that there was a new take.

The author, Arnold Eagle, received special mention at the 1955 Venice Film Festival for his film, The Pirogue Maker.—▶

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55mm f1.9	119.65	180mm f3.5	146.25
58mm f2	59.50	200mm f2.3	168.75
75mm f1.5	99.50	240mm f5.5	93.75
75mm f1.9	91.50	250mm f5.5	93.35
80mm f2	119.95	300mm f4	329.50
80mm f2.8	112.10	300mm f5.5	104.95
85mm f1.5	134.65	300mm f5	146.25
85mm f2	93.35	300mm f3.5	270.00
85mm f2.8	48.75	300mm f5.6	121.45
90mm f4	29.00	360mm f5.5	112.10
90mm f1.8	112.10	400mm f4.5	270.00
90mm f3.5	65.25	400mm f5	183.75
100mm f2.8	52.48	400mm f5.5	149.50
100mm f3.5	65.25	400mm f5.6	188.95
102mm f4.5	155.65	500mm f5	296.25
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50mm f2	93.75	300mm f5.6	112.50
50mm f1.1	337.50	300mm f5	146.25
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By ALLAN GREEN

New Anscochrome Color Film for 16-mm movies is available in rolls and magazines.

NEW Anscochrome Daylight Type Color Film for 16-mm motion-picture photography only is now on the market and offers amateurs a high emulsion speed (ASA 32) and a latitude that will yield acceptable results if exposure is as far off as 1½ stops from normal.

Before we give a rundown of all results obtained from our tests, let us look at a quotation from the manufacturer's data sheet:

"Anscochrome Daylight Type is a faster color film. Its higher speed greatly increases the range of subjects which can be photographed in color. It can be exposed in movie cameras in the same manner as black-and-white film. Its color balance is adjusted to give best rendition of average subjects in bright sunlight—from two hours after sunrise until two hours before sunset. It can also be used indoors with an Ansco Color Conversion Filter #10 (yielding Tungsten ASA rating of 8) over the lens."

For our tests, four different outdoor scenes were shot, (1) brilliant seascape, (2) subjects in deep shade, (3) subjects in a combination of sunlight and deep shade, and (4) a backlighted scene.

Equipment used: Bolex H-16 with a 25-mm Ektar f/1.4 lens; a Norwood Model A exposure meter which was carefully checked prior to the test, and a Spectra Color Temperature Meter to guarantee accurate color readings.

The results were as follows:

First scene (brilliant seascape): Where other color films would call for an aperture setting of f/9 at 24 frames per second, exposure for the new film was f/16 at the same speed. Final screen image was highly acceptable in color reproduction. Colors seemed a trifle warmer than other films but remained accurate and pleasing.

Second scene (subjects in deep shade): The meter indicated an exposure of f/3.5 at 24 frames per second. Screen image showed no loss of color quality. The colors had a pleasant pastel-like hue not usually found in other color films.

Third scene (subjects in combination of sunlight and shade): Exposure from shade to sunlight areas varied from f/3.5 to f/16 at 24 frames per second. An opening of f/5.6 was decided upon. In the screen image, all but the deepest shadow areas were highly acceptable and the highlight areas were almost equal to the first scene, where the diaphragm was set at f/16.

Fourth scene (completely backlighted): The wide latitude of Anscochrome was evident. Strong sunlight which was facing the camera was brilliant and highlight areas were a bit overexposed, while the reflected foreground areas had good color quality and could *not* be considered as underexposed.

Film will be processed by Ansco. Addresses of processing labs are given with the film.—▶

Low-Cost Sound

Bert Seckendorf

(*Continued from page* 177)

Cinesone is the first magnetic-sound attachment that will go on either 16-mm or 8-mm projectors to offer relatively simple operation and moderate cost. It isn't perfect, and I don't mean to imply that it is, but it is the best thing which has come along so far.

I've used Cinesone extensively for recording on 16-mm film and I'm very happy with the results. The quality of both voice and musical reproduction is excellent.

For those of you who are unfamiliar with putting magnetic sound on film, the process is this:

First you shoot your film and edit it to the footage you want for your final presentation. The edited film is then taken to any camera store or photofinisher, who will have the magnetic striping put on for you. This usually costs from two to three cents a foot. The striped film is then run through the projector while you make notes for appropriate background music and narration. Once this is completed, you are ready to put the sound on the film; first the musical background and sound effects, and lastly the narration.

Enlarged section from reel of striped 16-mm film shows what strip looks like. Laboratory applies it to left edge for about 2 cents a foot.

The Cinesone unit is assembled by slipping it on the feed spindle of the projector, and the film to be shown is placed on the supplementary arm built into the unit. The film is threaded through the Cinesone sound head and then right into the projector in the regular manner. The only other step is to plug the amplifier into the sound head.

To put in background music or sound effects, you simply attach a record player to the amplifier and turn on both the music and the projector.

To add narration, you rewind the film, plug in the directional microphone and start the film again through the sound head and projector. At the point where you want to add narration, you press a switch built into the cinesone sound head and start talking. The switch is an auto-

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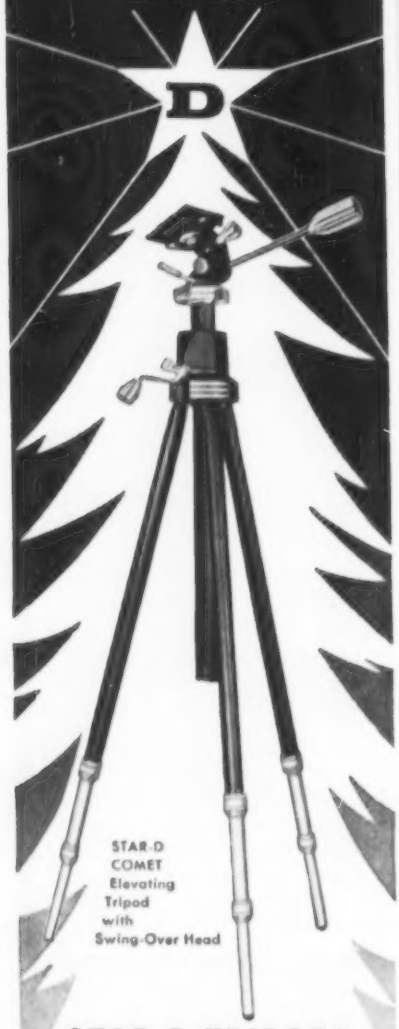

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matic background "subduer" which cuts the volume of the musical background down to the point where your voice can be heard above it. When you have finished speaking, you release the switch, and the volume of the music returns to normal.

Another feature of the Cinesone unit is the directional microphone which permits recording while right next to the projector. It is so constructed that you can work within two or three feet of it without having the projector noise record on your film along with your voice.—▶

J. F. Hollywood

(*Continued from page* 177)

selected and arranged the music; John Hefele handled the technical aspects, and I did the narration.

After showing it to the 8mm club, our conclusions were:

(1) Synchronization was excellent. We could offer no word of complaint. You started your projector and forgot about it. Sound and sight were perfectly in step every time the film was projected.

(2) Everyone who saw the film felt the voice quality reproduced excellently.

(3) There were quite a few complaints about the quality of the musical sound, although many members thought it was good enough to be passable. Those members who weren't impressed with the musical sound quality were for the most part used to the higher-quality musical sound produced by more expensive equipment.

I believe the quality of the musical sound can be improved, and I think considerable improvement will come when Cinesone can record music for 8mm at a higher speed and then play it back at that speed. By speed, I refer to how fast the film passes through the Cinesone sound head. You can get reasonably good sound results if the film is moving at a speed of 3.75 inches per second, which is the lower speed of most popular tape recorders. This means the film must be passing through the projector at between 24 and 25 frames per second.

Of course, this means you should shoot at 24 frames per second if you plan to add magnetic sound to your 8mm movies. Any slight variation in the projector speed will have little noticeable effect on the action, although any increase in such speed will make considerable improvement in the quality of the musical sound.

Most 8mm projectors are operated from 16 to 18 frames per second, which means the film is traveling between 2.4 and 2.8 inches per second. This is too slow for good musical sound reproduction.

The Cinesone tests MacGregor, Hefele, and myself made were conducted on my Bell & Howell Picturemaster, which has a top speed of 20 to 21 frames per second. This means the film was still moving too slowly—only about three inches per second.

In the meantime, if you want perfect sound and picture synchronization and good voice reproduction, Cinesone will give it to you. If you try background music at 24 frames per second, Cinesone may satisfy your notion of acceptable sound as well.—▶

Disneyland's Circarama

(*Continued from page* 96)

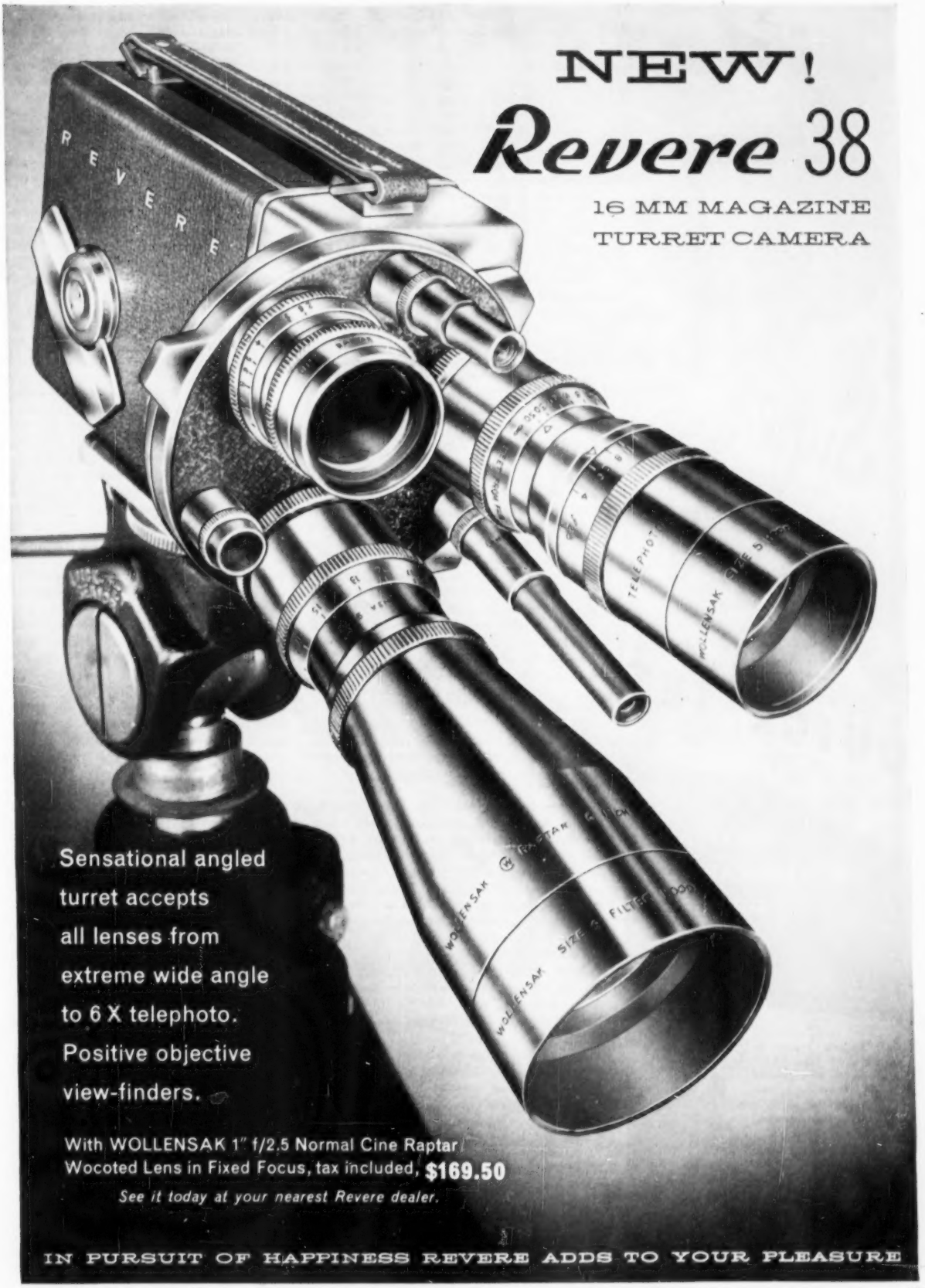
They eliminate the disturbing jiggle between adjacent screen sections which makes Cinerama (the original *triple-image* wide-screen projection system) less perfect than the various wide-angle and anamorphic *single-image* projection systems in use today.

The Circarama presentation put on by American Motors is a combination of sheer entertainment as well as frank and subtle advertising content. The main purpose of the company's exhibit at Disneyland obviously is to sell Nash and Hudson automobiles and Kelvinator and Leonard household appliances, all of which they manufacture. Throughout each 12-hour day, there are three 12-minute Circarama showings per hour separated by eight-minute intermissions during which the audience is turned over.

As the show opens, a voice explains the projection medium and introduces the line of Kelvinator appliances, full-color slides of which are projected in quick succession on each of the 11 screens comprising the Circarama unit, and the audience follows the progression of images until they are completely surrounded. At this point, the surrounding screen seems to have moved back from the audience a considerable distance. The screens are then blacked out all at once and a title *A Tour of the West* appears on one of the "forward" screens, on which the audience quickly focuses its attention. From here, the show goes on with all 11 screens filled with a continuous 360-degree image of scenery observed from an automobile cruising through Beverly Hills, into Wilshire Boulevard, and then on to the Los Angeles freeway system en route to the colorful Grand Canyon and Monument Valley sections of the Southwest. It winds up with a slow detailed inspection tour of the fabulous Las Vegas gambling and entertainment resort.

As the automobile tour begins, the audience tends to look straight ahead at the forward sections of the screen, ignoring the images to the side and behind. But as the "ride" continues, the people react as passengers in an automobile are wont to do—looking out through the car windows on the side as interesting roadside objects are passed, and eventually out the back window to see the cars following on the highway. Happily, the narrow divisions between the sections of the surrounding screen seem like the upright posts of a car and the illusion and feeling of cruising in a car is complete. The cars ahead and behind seem to be traveling along at a moderate rate of speed with the scenery beyond moving proportionally faster. Meantime, the scenery passing by on the sides seems to be whizzing by.

When the cruising car swings into Wilshire Boulevard, the audience is suddenly hurtled through traffic at a break-neck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clip with what seems to be a police car with siren wailing in full pursuit. The car weaves in and out of traffic, swinging to the right and then to the left, alternately slowing down and speeding up, avoiding accidents by split-second maneuvers. You get the feeling during this sequence that you're going to go through the windshield, fly through the side door, or fall right off your feet as the car twists and turns and the onrushing opposing cars come at you. You can't help breathing a sigh of relief when the sequence ends.

As the scene shifts to the colorful Western scenes to the east of Los Angeles, the action is far more placid. Scanning the screen around you, you get the feeling of being almost alone in the vast beautiful desert wilderness—an integral part of the location and not an observer. The Las Vegas sequences lose a bit of the feeling of participation, which is more the result of incomplete production planning than a limitation of the medium.

The idea of shooting and presenting a completely enveloping screen show originated with the Walt Disney organization; credit for working it out is shared by Eastman Kodak, whose cameras, projectors, and 16-mm Commercial Kodachrome film as well as technical consultation service comprise an essential part of the presentation; by the Ralke Company of Los Angeles, who were responsible for the installation and maintenance of the Circarama unit; by the Urban Engineering Company of Hollywood, who perfected the synchronization of the projectors and sound system, and by Kinevox, Inc., of Hollywood, who engineered the audio portion of the presentation. The film itself was produced by Walt Disney Productions under the supervision of William H. Anderson.

The original Disney projection plan for Circarama had called for a central gondola from which 12 images would be thrown on as many screens surrounding the audience. With a working area only 40 feet in diameter, however, extremely wide-angle short-focal-length projection lenses would have been required, with attending image distortion. The projection problem was solved by using a doughnut arrangement as illustrated in the diagram on the opening spread of this article, with projectors throwing their images directly across the entire 40-foot area from positions behind the respective six-inch screen dividers. Obviously, an odd number of screen segments was required—11 projectors equipped with 15-mm (1⅜-inch) lenses covered 360 degrees of arc perfectly.

The engineering details of the Circarama installation are outside the scope of this article, but several interesting features are worthy of note. Eastman Model 25 16-mm projectors equipped with 1,000 watt incandescent lamps and fitted with variable-focus 1⅜-inch Expanso lenses (made by the Pacific Optical Company) are used. Since the projectors are about 12 feet apart it was impossible to link them together mechanically as is done in the Cinerama system. Instead, the projectors are equipped with slotted-rotor synchronous-drive motors that keep time with each other on the basis of the alternating cycles of the a-c electricity that drives them. To compensate for voltage fluctuations which might tend to slow down or speed up one or another of the projectors in the battery, and also to synchronize the projectors with a four-track sound reproducer, a Selsyn motor-control unit was superimposed on the projector installation. This unit consists of a set of slave motors, actuated by a master unit which employs an electronic device to determine when one motor is ahead of or behind the others. It automatically slows down or speeds up the out-of-phase motor's speed until perfect synchronism is achieved. A special clutch installation permits this to be accomplished in a matter of 1½ to 2 seconds without causing the out-of-phase image to bounce.

Should the film break in one of the 11 projectors, the projector is instantly stopped for the balance of the particular showing and a warning light goes on at the master control panel to alert the attendant to the fact that he has to replace the broken reel with one of the stand-by prints that are kept on hand for such emergencies. Whenever a bulb burns out in a projector, an automatic bulb-changing mechanism on the projector swings the burnt-out bulb out of position and replaces it with a fresh one so that the picture goes on again in less than two seconds. Again, a warning light is flashed at the control panel to signal the attendant that a fresh bulb must be inserted into the stand-by socket of the particular projector's bulb changer.

The sound recorded on the four magnetic channels of the sound strip is fed into a bank of four six-inch speakers mounted beneath each projector. This permits the house either to be flooded with sound from all speakers or distributed in a directional pattern by proper speaker and channel selection, both of which are employed in the course of the showing.

The images projected by the eleven units in the Circarama installation were originally photographed with a battery of 11, 16-mm Ciné Kodak Special cameras with 200-foot prethreaded film magazines. These were mounted rigidly on a circular platform in a circle covering 360 degrees of arc. The drive shafts of all the cameras were linked mechanically by means of a single sprocket chain. The tachometer permitted precise control of the shooting speed through a full range of adjustments from 8 to 24 frames per second.

Most of the scenes in the Circarama film were shot with the camera platform mounted on top of a Nash Rambler station wagon, with the driving power supplied by batteries and a push-button control inside the car to start, stop, and control the cameras. In one sequence, the rig was mounted on top of a motor launch. Incidentally, the nerve-shattering Wilshire Boulevard sequence was achieved by merely slowing down the camera operating speed to 8 frames per second while the camera car made a number of relatively safe maneuvers in traffic. When this was accelerated three times at the normal 24 frames per second projection speed, the illusion of danger was spectacular. Adding the wail of a siren to the

sound track put the finishing touch on the effect.

Is a complete 360-degree surround essential to the impact and message of the American Motors show? The illusion of riding along in a car could not have been achieved otherwise. Can one be sure that the entire audience has voluntarily scanned the images on all sections of the surrounding screen at some time or other during the motion picture performance? The film producers must have thought of that one.

One of the Las Vegas scenes is set at the poolside of an extravagantly beautiful resort motel where the "forward" cameras pick up two charming young ladies in delightfully form-fitting bathing suits. With the cameras fixed and their lenses trained from knee height on their fascinating subjects, the bathing beauties walk separately with consummate poise along paths on either side of the battery of cameras, meeting each other again at the rear. As can be expected, the pop-eyed audience is beside itself trying to follow the "action" around the screen.

Has Circarama a future? It doesn't seem likely as a story-telling entertainment medium. On the other hand, it has infinite possibilities in the form in which it made its appearance at Disneyland—as a travelogue device, to subject an audience to an unusual visual and emotional experience, and to sell a product or institution. Is there still another step in wide-screen movie projection? Conceivably, a system might be devised in which the audience is suspended in the center of a sphere and visual images are screened all around, above and below. Would it serve a useful purpose? Well, your guess is as good as anyone's.—▶

More Scope for Your Camera

(*Continued from page* 100)

stress on the lens mount unless a supporting hand is held firmly under the binoculars; if the special clip is used to affix the binoculars to a tripod, extra support should be under the camera body. The device is available from Karl Heitz, Inc., 480 Lexington, New York, N.Y.

If any general rules may be laid down for the assurance of success in telescopic or binocular photography, they are these: practice your camera handling until you are steady as a rock—or use a tripod; use the fastest shutter speed the lighting conditions will allow you; remember that at long distances you are likely to run into problems of haze or heat waves—for the former you can try a 3-in. square haze filter over the 'scope's objective lens, but for the latter you can do nothing but come back tomorrow; telescopic lenses tend to be relatively flat in contrast, so best results will be obtained with a relatively contrasty film such as Plus-X, under contrasty lighting conditions; practice focusing until you know the relative degree of sharpness to expect from your equipment; always check to make certain that camera and eyepiece are in a straight line, protective cap in place. These are tools, and if you learn how to use them well, you can get good pictures.—▶

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35-mm Today

(*Continued from page* 56)

rating of only 40 ASA, and make pictures at 320 ASA by developing in Promicrol or Microphen, it doesn't matter if we are "increasing the film speed," or merely "exploiting the latitude toward underexposure" of Plus-X. We get the picture either way. If there were no differences between developers we should be able to get the same results from Microdol, F.R. X-33B, and DK-60a. But each of these developers will produce quite different results, and at the speed index of 320 ASA, none will approach the negative quality of Promicrol and Microphen.

When a scientist sees the phrase "increasing film speed" he thinks in terms of doing something directly to the emulsion to make it more sensitive to light. When a photographer sees the same phrase he reacts in terms of setting the emulsion-speed control of his exposure meter to a higher-than-normal figure and shooting according to readings obtained with this setting.

If the purpose of our test is to discover what kind of pictures can be made with a given film or developer, let's forget about sensitometry and stick to photography. Despite any aeronautical engineering opinions to the contrary, the bumble bee *can* fly, and if you want to put on an exhibit of photographs by sensitometrists go rent a phone booth.

All of which does not mean we should attempt to be as unscientific as possible. Far from it. Whether we're testing a film or a developer, there are five important sets of controls we must exercise. These are:

No. 1: *Subject controls.* Obviously we must use the same subject throughout the series of test exposures. He, she, or it should not move around so that lighting values change.

No. 2: *Lighting controls.* The lighting employed should not vary at all during the course of the test shooting. It should be planned carefully so as to be appropriate to the test. In other words, if we are testing a developer alleged to have great merit in suppressing excessive lighting contrasts, there is little point to making the test under very flat lighting.

No. 3: *Exposure Meter Controls.* The exposure meter should be used correctly to determine our initial exposure. If a reflected-light instrument is employed it is important to note various highlight, shadow, and middle-tone values. In this respect an incident-light meter (our personal preference is overwhelmingly in favor of the Norwood Director) is highly preferable because it measures total illumination striking the subject and gives an automatically integrated exposure with little or no possibility for human error. (More about this next month.) In either case, reflected- or incident-light readings should be made from the subject position to ensure the maximum accuracy.

This is the first of a series of three columns on testing equipment and materials. Next month we will continue with camera controls.—▶

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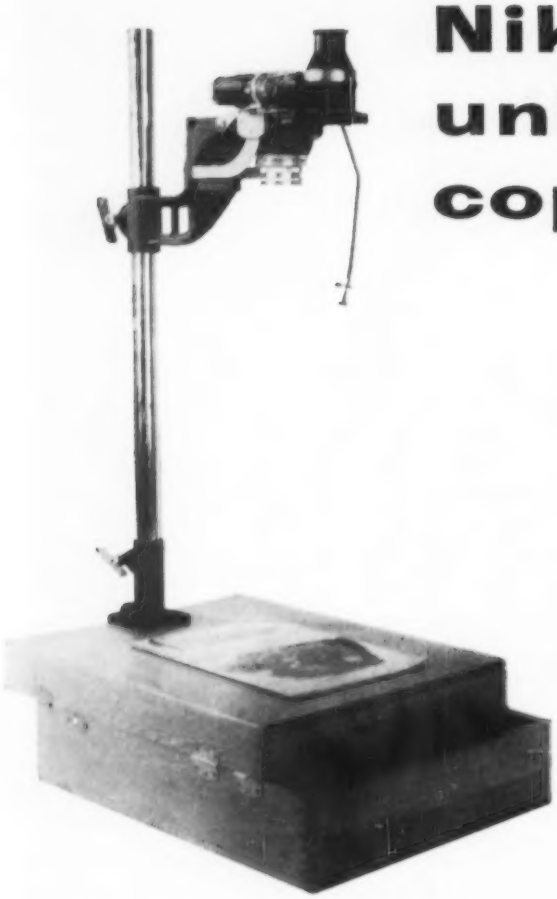
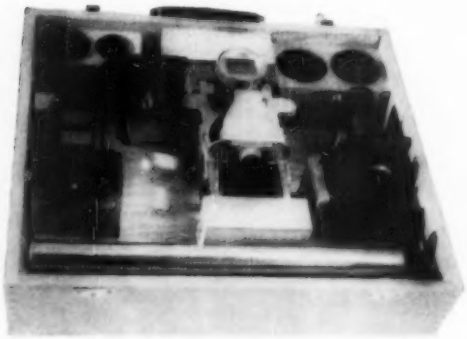




Assembled unit, in exposure position (left). Upright post clamps to box which serves as base. Right, dismantled unit in fitted case.

THE enterprising manufacturers of the Nikon camera, Nippon Kogaku of Tokyo, have expanded their line of accessories with a well-designed and efficient copying outfit, the Nikon Macro-Copy. From its polished hardwood case to the obvious precision of its working parts, the Macro-Copy is a worthy and versatile member of the Nikon team.

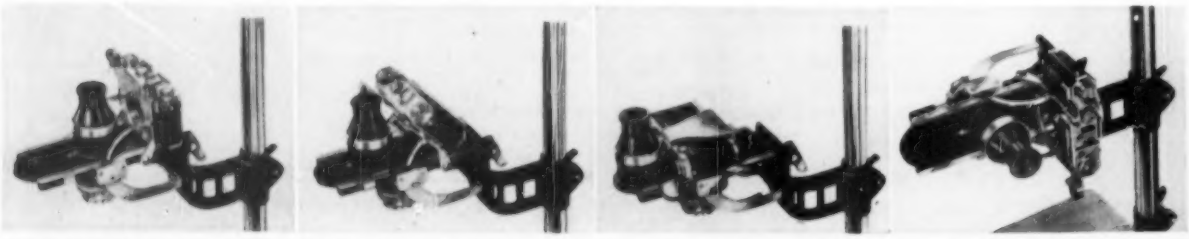
Essentially, like any copying device, it adapts the camera body and lens to the particular job. But it has some notable refinements. In accord with the Oriental tradition of wasting nothing, the Macro-Copy's sturdy case becomes the working surface and base of the instrument itself. The upright post is clamped securely to it, giving a firm support for the finicky job of copying.

The Nikon body is held in a bracket on the arm of the stand, and the normal lens is inserted in a bayonet mount under the instrument's stage. There is a focusing lens, for viewing the image on the groundglass. The mount of this lens is coupled with the bracket holding the camera box, so that as one is swung into position, the other is swung away. This is accomplished by means of a curved, toothed arm which engages a gear, insuring a positive, precision shift from focusing to exposure position in a single motion.

The wooden case is fitted inside with padded blocks to support the parts of the disassembled unit, so that none can be dislodged when the case is closed. There is space for the camera body, and a compartment for the lens, if one desires to carry them there.

The head of the Macro-Copy can be swung sidewise at any elevation, for copying of large documents that must be suspended from a wall, or for use of the outfit in macro-photography for such applications as medicine, dentistry, criminology, identification, map duplication, philately, numismatics, and the documenting of biological and mineral collections.

The camera bracket will also accommodate Contax cameras, and the stage will accept the bayonet mountings of Contax lenses. Net price of the Nikon Macro-Copy is $175.—



Four positions of copying head, from left: focusing eyepiece over camera lens; camera box moving forward into shooting position, with eyepiece shifting forward; body in place over lens; horizontal position for copying large subjects that are held in position on wall.

Electricity

(Continued from page 158)

third type is used only in heating equipment such as print dryers or mounting presses.

Keep the following safety rules in mind when handling any electric cord, photographic or otherwise.

1—Always pull a plug from an outlet by grasping the plug itself. Never jerk on the wires. This can cause a short circuit.

2—Always plug equipment cords such as flood- and spotlights, print dryers, etc., into wall outlets, spider boxes, or heavy-duty extension cords. Never use a lamp extension cord nor plug into a hanging light socket. Heat developed in the small wire can burn through the insulation of a light-weight cord and start a fire.

3—Never tack extension cords to walls or baseboards. They are not intended for permanent installation. A tack or even an "insulated staple" may cut through the cord's insulation and cause a short circuit.

4—Never splice equipment or extension cords to get added length. Always make plug connections.

5—Buy only electric cords carrying an Underwriters' label. This is your guaranty that the cord has met minimum safety specifications set up by the National Board of Fire Underwriters.

Most of us have had the experience of a fuse blowing out when we turned on an electrical appliance, or have seen the lights flicker and dim when a refrigerator or washing machine started. Perhaps you have had the more serious experience of seeing an extension cord to a floodlight or other piece of equipment suddenly begin to smoke and then burn with an arcing flash of fire, as the insulation disintegrated and allowed the copper conductors to touch.

What happened? The answer is, an overload. This means more electrical current was drawn through the wires than they were designed to carry. When that happened, excessive heat was generated. If it was present long enough, the fuse either blew out or the wire's insulation charred and began to burn.

Overloading takes place under three conditions:

1—When more equipment is plugged into a wiring circuit than it is designed to handle.

2—When electrical equipment starts. It takes more current to start equipment than it does to keep it operating. This is especially true of motor-driven appliances such as fans and motion-picture machines.

3—When there is a "short" in the circuit. This takes place when the two metal current-carrying conductors accidentally touch each other, permitting an excessive amount of current to pass through the circuit.

Two types of safety devices are used to guard against overloading the electrical circuit of a building. They are fuses and circuit breakers. These are designed to transmit only the amount of current which the particular circuit is designed to carry. When excessive current—overloading—is drawn into the circuit, they

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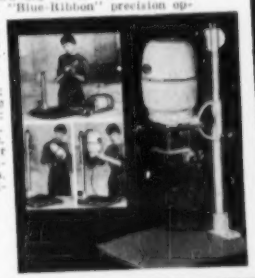

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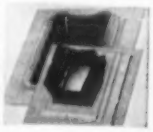

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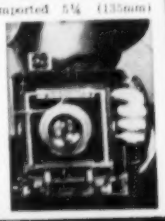

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either blow out or trip, thereby cutting off the current.

A fuse consists of a strip of metal that will melt more easily than the wires in the circuit. When the circuit is overloaded, the metal strip melts—the fuse blows—and cuts off the current before the excess heat burns the wire's insulation and perhaps starts a fire.

Fuses are rated according to the number of *amperes* the particular circuit is supposed to carry, such as 10, 15, 20, etc. Ordinary house fuses are designed to carry a slight overload to take care of excessive current needed to start equipment, but will blow out if the overload continues. Special time-delay fuses are used when extra-heavy starting loads are needed as in large motion-picture projectors and professional print-washing machines.

The circuit breaker—which is being used in practically all new construction today—is simply a switch which turns off automatically when the circuit is overloaded. Its advantage over a fuse is that you merely have to reset the switch, whereas a burnt-out fuse must be replaced before the circuit can be put back in operation.

You must remember that before you can replace a fuse or reset the circuit breaker the cause of the overload must be removed. Otherwise, the new fuse will just blow out or the circuit breaker will trip again.

There are two important safety measures in regard to fuses.

1—You must never use a fuse of higher amperage than the circuit was designed for.

2—You must never bridge a fuse. This means to put a penny or piece of wadded tin foil behind a burnt-out fuse if you don't have a new one to replace it. In both cases you by-pass the safety device in the circuit, thereby endangering not only your property but your life.

In most localities, electricity supplied to homes and buildings is 60-cycle alternating current (a-c for short). This means the current flows through the wire in one direction then reverses itself and flows in the other. This happens 60 times each second. Each complete reversal, first in one direction then the other, is a cycle. Abroad and in a few places in this country—primarily where older generating equipment is in use—buildings are supplied with direct current (abbreviated d-c) in which the current flows continually in only one direction. You may encounter alternating current having a different cycling rate.

All photographic equipment will work on alternating current, and most will operate satisfactorily on both alternating and direct current. Some equipment will work only on a-c, however, and should d-c be used, it will burn out the equipment's internal wiring. This is especially true of electronic equipment such as print timers, tape recorders and sound motion-picture machines. Usually equipment is marked by the manufacturer to indicate what type of current is needed to make it work properly.

Electrical current in a wire is very much like water in a pipe. It flows in one end and out the other. The amount of current is called *amperes* or amps, and the pressure pushing it is *volts*. The product of the two is called *watts*, which is the unit of electrical power. The formula is written—

$$\text{AMPS} \times \text{VOLTS} = \text{WATTS or}$$

$$\frac{\text{WATTS}}{\text{VOLTS}} = \text{AMPS}$$

Buildings have three types of wiring circuits:

General-purpose—Used for normal room lighting and base receptacles. These are rated to supply 15 amperes on a 120-volt system for a total of 1,800 watts.

Small Appliance—Used in kitchens, laundries, and work rooms. These supply 20 amperes on a 120-volt system for a total of 2,400 watts.

Individual Equipment—Used with individual pieces of equipment needing large amounts of current, such as hot-water heaters, stoves, etc. These are usually rated at 20 or 30 or more amperes, depending on the amount of current the particular appliance needs.

Let's take a No. 2 photoflood bulb and see how all this applies. The No. 2 bulb is rated by the manufacturer to require 500 watts to operate properly. The public utilities push the electric current through the wires at a standard pressure of 120 volts. To find out how much current (amperes) is going through the wire, we divide the needed 500 watts by the supplied 120 volts. The result is 4.16 amperes.

Suppose we plugged the No. 2 bulb into a general-purpose circuit guarded by a 15-ampere fuse. It would work efficiently. Even two or three bulbs would still operate safely on such a circuit. If we needed a fourth bulb, however, we would get ourselves in trouble. That many bulbs would draw 16.64 amperes through the wires. The resulting overload of 1.64 amps would cause the 15-amp fuse to blow.

To find out how many light bulbs and other pieces of equipment can be plugged into a particular circuit, add up the wattage of all the pieces of equipment and divide it by the voltage (in most cases 120). The resulting figure will tell you exactly how much current (amperage) would be drawn through the circuit. If it is more than the fuse guarding the circuit, the fuse will blow out. If it is less, you are safe.

Tracing household circuits

Finding which lights and base receptacles are on any one circuit is simple. Just unscrew the fuse or turn off the circuit breaker for the circuit you are interested in. Those lights and base receptacles that DO NOT operate are on that circuit.

Here is what you do if a fuse blows or a piece of electrical equipment fails to work, even though the circuit is not overloaded.

1—Unplug the appliance and check it for obviously frayed, loose, or broken wires. See that there are no cracked or broken plugs, sockets or switches. If it is a light or lamp, see if the bulb is burnt out.

2—If a fuse is burnt out or the circuit breaker tripped, replace the fuse with

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facsimile or reset circuit breaker.

3—Plug another piece of equipment into the same receptacle. If it works, there is something wrong with the appliance itself. If the second piece of equipment also fails to work or a fuse blows, there is something wrong with the house wiring.

Once you know the trouble is in the appliance, and not in the wiring circuit of the building, and if there is no visible evidence of damage, the only thing to do is to disassemble and check each individual part of the appliance.

If the trouble is in the building's wiring rather than in the equipment, call in a licensed electrician. It is beyond the scope of this article to give instructions in trouble-shooting and repairing damaged house or building wiring.

Most trouble in electrical equipment is found where wires connect with each other, or with sockets, plugs, switches, and heating elements, or when one of these parts is broken or damaged.

Wires are connected either by being screwed to a plug, switch, or socket, or by being spliced to another wire. The important thing is that the connection must be insulated and must be as strong as the wire itself. Improper or loose connections and insulation are a fire hazard and a frequent cause of electrical shocks.

Here are the steps for making connections:

1—Remove insulation carefully so there are no nicks or broken strands and the wires are clean of tarnish and scraps of old insulation.

2—For splices, match the colors of the wires. That is, black to black and white to white, or white to the wire having a colored thread running through it. Twist the wires together tightly so they will not be easily pulled apart. Solder if there is to be any strain on the wires. Wrap the wires with sufficient insulated tape to have the same insulating value as the original covering of the wire.

3—For screw connections, tie a Fire Underwriters' Knot (see illustration). Twist the wires around the screw terminals in a clockwise direction, and tighten the screws. The clockwise twist will keep the wires from working their way out from under the screws. Solder if there is to be any strain on the connection.

Electricity is dangerous. It can cause fires, painful shocks and burns, and even death if it is improperly handled. Observe the following principles. They will eliminate practically all possibility of "accidents."

1—Use only appliances that meet the minimum safety requirements of the electrical code set up by the National Board of Fire Underwriters. The equipment should carry the approval seal of the Underwriters' Laboratory.

2—Use only the proper-size fuse in a fuse box. Never bridge a burnt-out fuse with a penny or piece of tinfoil. Either practice will eliminate the safety factor in the fuse and increase the danger of fire.

3—Always consider all connected appliances as being "alive," even if turning on the switch does not make them operate.

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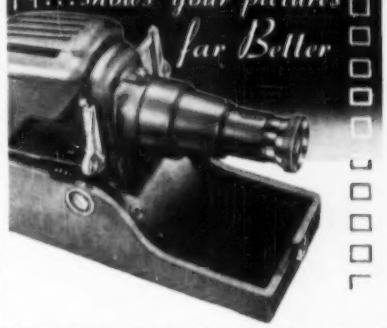

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4—Always disconnect appliances from outlets before making electrical repairs.

5—Always check wiring and appliances for wear or broken parts before putting them into use. Be especially careful if they receive rough treatment or have been dropped. If parts show wear or defects, replace them before using the equipment.

6—Never make "temporary" repairs. Any makeshift repair must satisfy the same mechanical and electrical standards as that of a permanent installation.

7—Always stand on dry surfaces when handling "hot" electrical equipment. This also holds true when working with switch and fuse boxes. If the ground is wet or damp stand on a piece of dry board. REMEMBER, accidental grounding while touching a hot wire will complete a circuit through your body, resulting in a shock, burn, or even death.

8—Never work on the permanent wiring of a building unless you know exactly what you are doing. That is the job of a licensed electrician.

9—Never work on high-power transmission lines. That is the job of the public utility company.

GLOSSARY OF ELECTRICAL TERMS

Alternating current—Current which flows through the wires in the circuit first in one direction, then reverses itself and flows in the other.

Ampere (Amp)—The amount of electrical current flowing through the wires.

Circuit—A closed system in which electrical current runs from the power source to outlets where it is used, then back to the power source.

Circuit breaker—A safety device which automatically breaks the circuit when there is more current in the wires than they are designed to carry.

Current—A movement of electricity comparable to that of water in a pipe. The more there is, the more power, heat, or light it is able to produce.

Cycle—One complete reversal of an alternating electrical current.

Cycling rate—The number of cycles per second in alternating current. (The standard rate in the United States is 60 cycles, although in a few areas where specialized or older generating equipment is in use, other cycling rates will be found.)

Direct current—Current which flows through the wires of the circuit in one direction only.

Fuse—A safety device containing a strip of metal which will melt more easily than the wires in the circuit.

Filament—A thread-like conductor usually of wire, that heats and gives off light when electric current is passed through it.

Fluorescent lamp—A tube containing a gas or powder which glows when electricity is passed through it.

General-purpose circuit—Building circuit used for fixed lighting and small portable appliances such as enlargers, timers, etc.

Heating elements—The wires inside a print dryer or mounting press which radiate heat when the current flows through them.

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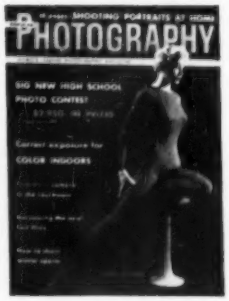

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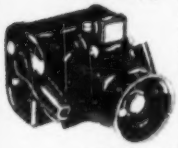

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General Electric—All their bulbs except the No. 11 may be fired safely with ordinary household current (120 volts—60 cycles.) They suggest wiring a 100-watt bulb in series when firing bayonet-based bulbs in this manner to help reduce the amount of current going through the circuit.

Sylvania—Only their No. 2, No. 3, No. 2B, and No. 3B bulbs can be used safely.

Westinghouse—Only their No. 22, No. 31, No. 50, No. 22B and No. 50B bulbs can be used safely.

Flashbulbs designed for use in a household circuit have a soft wire inside which burns through as the bulb is fired, thereby preventing a short circuit. This wire, in other words, acts as a fuse for the bulb.

Other flashbulbs made by these companies do not have this built-in fuse, and there is the chance that excessive current might overload the bulb, thereby shattering it, blowing out a fuse, or damaging the lamp socket or building wiring.

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Overload—When more electrical current goes through the wires than they are designed to carry.

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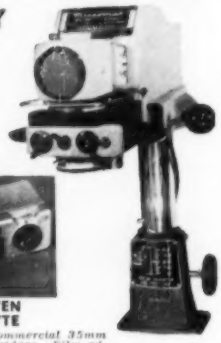

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Socket—A receptacle in which light bulbs are inserted.

Solid wire—A wire having a single heavy strand covered with insulation.

Spider - box—A box having two or more electrical outlets. It is connected to a base receptacle by an extension cord, and each outlet is usually controlled by an individual switch.

Splice—Point at which two or more wires are connected.

Stranded wire—An insulated wire having numerous small strands twisted together to form a single cable.

Switch—A mechanical method of opening or closing a circuit.

Terminal—Point at which a wire is attached to a switch, plug, or socket.

Volt—The electrical pressure in the wire; the force causing current to flow.

Watt—The unit of electrical power—determined by multiplying volts by amperes.—

Meet Winners—*from page 64*

Maddocks, of Hollywood, California. Maddocks, a native of Long Beach, California, is a magazine photographer whose work has been published in a number of fashion magazines and other publications, and he has won several photographic awards. He attended schools in California and after he had completed his college studies he enrolled and studied at the Fred Archer School of Photography. Maddocks is married and has one little boy.

Maddocks

Eirvin M DeWitt, Jr., who won fifth prize in color for his picture of *Oba-San* (*page 101*), is a Lieutenant in the United States Army, at present stationed overseas. DeWitt was born in Jacksonville, Florida and attended schools in Florida. He studied photography at the Photographic Laboratory, Technicians School of the Army, and has done a substantial amount of photographic work, both still and motion-picture, in connection with his Army service. He is married; has a small daughter.—

De Witt

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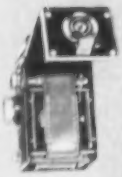

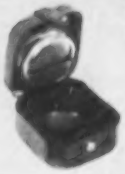

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TECHNICAL DATA ON THE PICTURES

First Prize—Black-and-White

PAGE 102-103 Hideichiro Katayama, of Nagoya, Japan, won first prize in the black-and-white division of the POPULAR PHOTOGRAPHY 1955 Picture Contest for his high-angle shot of celebrants of a *Hadaka-Matsuri* Festival—a traditional event held annually in Konomiya, Japan, during the coldest season of the year, and celebrated by the male population. Regardless of the cold, the participants remove most of their clothing as evidence of their health and strength, and vie with each other to touch a celebrant who has been designated in advance as "holder of the power of good luck for the coming year." To get the most advantageous view of the closely-packed and surging mass of participants, Katayama climbed a tree and made the shot with a 4x5 Pacemaker Speed Graphic and 135-mm Kodak Ektar f/4.5 lens, exposing for 1/50 second at f/8 on Sakura USS film. Lighting was sunlight, supplemented by one No. 5 flashbulb.

Second Prize—Black-and-White

PAGE 104-105 Winner of second prize in this division is Michael A. Mardikes, of Kansas City, Missouri, for his early morning photograph of fishermen and boat near Vera Cruz, Mexico. As Mardikes was driving south along the shore, he saw this group of fishermen pulling in their net, then patiently starting to untwist some tangled strands of the net before starting out again. There was a compelling beauty in the dawn lighting and composition of the scene, and Mardikes proceeded to record it with a Rolleiflex 2.8C and 80-mm Schneider-Kreuznach Xenotar f/2.8 lens, on Super-XX film, through a Wratten 2A filter. Exposure was 1/250 second at f/8, with early daylight softened by clouds.

Third Prize—Black-and-White

PAGE 106 Third prize in black-and-white went to Otto Daettwyler, Menziken, Switzerland, for his photograph of three gypsy girls. Daettwyler was making a study of the customs and life of the French gypsies, and in order to acquire first-hand knowledge and understanding of their ways, he traveled for a week with a gypsy tribe in southern France, living in their *roulotte*, or van. He used a Rolleicord IV with 75-mm Xenar f/3.5 lens to make this picture, at the close of a group dance. Shutter speed was 1/25 second at f/4 on Ilford HP3 film, utilizing existing light.

Fourth Prize—Black-and-White

PAGE 107 Fred S. Schiffer, Buenos Aires, was awarded fourth prize in black-and-white for his well-composed photograph of a graceful nude. Schiffer used electronic flash and a Rolleiflex with 75-mm Tessar f/3.5 lens for this studio shot.

Fifth Prize—Black-and-White

PAGE 108-109 His photograph of a group of people waiting for a parade in his home town of Dallas, Texas, won fifth prize for John Rogers. The group was utilizing a builder's temporary sidewalk by-pass as a vantage viewing point, and Rogers saw an interesting pattern in the grouping and structural lines. His camera was a Kodak Ektra with 135-mm Kodak Ektar f/8 lens, and exposure was about 1/250 second at approximately f/8. Rogers underexposed the negatively purposely, to reduce possibility of flare from the streaks of direct sunlight, and made the print with No. 10 filter on High Speed Varigam paper.

Fifth Prize—Black-and-White

PAGE 110-111 Antonio Migliori, of Bologna, Italy, was awarded fifth prize in the black-and-white division for his interestingly composed picture giving a brief glimpse into the life of a family, on a summer evening in Bologna. Migliori's camera was an Ikoflex IIa, with 80-mm Tessar f/3.5 lens. Utilizing available light at sunset and the existing light within the room where his models were sitting, Migliori exposed Ferrania film for 1 second at f/8.

PAGE 112 Leo Stashin, New York City, photographed this lithe and enthusiastic mambo dancer at a party in Greenwich Village. Stashin's camera was a Canon IVS2 with a 28-mm Serenar f/3.5 lens. Exposure was 1/25 second at f/32 with electronic flash, on Tri-X film.

PAGE 113 An inside wall of a garage, daubed with experimental mixtures of paint, formed the background for Michael A. Mardikes' informal portrait of *Mr. Smith*. The picture is one of a series that Mardikes was making in experimentation with cross lighting from soft light sources. He used a Rolleiflex with 80-mm Xenotar f/2.8 lens, exposing for 1/100 second at f/5.6 on Super-XX film, with light yellow filter. The negative was developed in Panthermic 777 to Gamma of 5.

PAGE 114 Walter Chandoha used an Automatic Rolleiflex with 75-mm Tessar f/3.5 lens to make this appealing photograph of his little daughter. It is one in a series of unposed shots that he has been making of the child since her birth, as a record of her growth. Shutter speed was 1/250 second at f/16 on Ansco Supreme, with bounced speedlight.

First Prize—Color

PAGE 115 His impromptu portrait, in subtly blended tones, won first prize in the color division for Daniel R. Rubin, of Elmhurst, N. Y. Rubin had been making some black-and-white portraits in his studio, and during a break in the shooting he was impressed by the color effect of the natural north light upon his model as she rested, unposed and relaxed. "I quickly put a sheet of color film in the camera," says Rubin, "and made the shot before she knew it." Camera used was an Eastman 8x10 View with 12-inch Ektar f/6.3 lens. Ektachrome Daylight Type film was exposed 4 seconds at f/11.

Second Prize—Color

PAGE 116 Walter Chandoha, Huntington, N. Y., was awarded second prize in color for his shot of an alert little terrier, reproduced in black-and-white on page 116 and in color on the cover of this issue of POPULAR PHOTOGRAPHY. Chandoha first saw the terrier at the Westchester Dog Show and thought it so appealing that he asked its owner to bring the dog to his studio so he could photograph it. He made the picture with a Graflex Super D camera and 190-mm Ektar f/5.6 lens. Exposure was at f/22, using drop curtain, and four Ascor speedlights (total 1000 watt-seconds).

Third Prize—Color

PAGE 116 A shot of hunters silhouetted against the sky won third prize in the color division for Joe Clark, Detroit. Clark used a Leica IIIf with 135-mm Hektor f/4.5 lens. Exposure was for 1/25 second at f/5.6 on Kodachrome film.

Fourth Prize—Color

PAGE 117-118 As one of a series of test shots in design and composition, Joseph H. Maddocks, Hollywood, California, made this well-composed photograph for which he was awarded fourth prize in color. Maddocks' camera was an 8x10 Deardorff equipped with 14-inch Goerz f/7.7 lens. Exposure was for 1 second at f/11 on Ektachrome film, with 81A filter, using bounce light from ten No. 2 photofloods and one No. 2 photoflood direct.

Fifth Prize—Color

PAGE 119 Fifth prize in the color division went to Lt. Eirvin M. DeWitt, Jacksonville, Florida, for his photograph of a Japanese grandmother in the kitchen of her home. The subject, the lighting, and the surroundings appealed to DeWitt as "reminiscent of an Old

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Master," he says, and he made the shot with a Contax IIa and 50-mm Zeiss-Opton Sonnar f/2 lens. Exposure was 1 second at f/2 on Kodachrome Daylight Type film, with available light coming through a small skylight about five feet above the model.

PAGE 120 Hazy sunlight filtering through light fog at sunset imparted a luminous, almost unreal quality to this quiet coastal vista photographed by Elmore C. Adams, of San Francisco, who was impressed by the calm and restful beauty of the scene. Adams used a Leica IIIf camera equipped with 50-mm Summicron f/2 lens. Exposure, determined by meter, was 1/20 second at f/4.5, on Kodachrome Daylight Type film.

The skin tones and contours of a graceful torso are enhanced by contrast with the deep green leaves in this composition by Benn Mitchell, New York City. His camera was a Canon IV with 50-mm Serenar f/1.8 lens, and the shot was made on Kodachrome film (Daylight Type), with shutter speed of 1/25 second at f/5.6, and Skylight filter.

As Raymond L. Propst, of Albany, Oregon, watched the pole-vaulting events at a college track meet, he saw an interesting picture possibility in the flashing color against background of intensely blue sky. As the next entrant in the event leaped "up and over" Propst caught this peak-of-action shot with his Rolleicord and Schneider-Xenar f/3.5 lens, exposing for 1/200 second on Ektachrome, with lens wide open.

PAGE 121 Color and rhythmic movement in a circus ring inspired John D. Walker, Brooklyn, N. Y., to make this shot. He planned it to register motion of the horse in foreground, in contrast with sharper delineation of other figures in the ring. Walker used a Leica IIIf camera with 85-mm Nikkor f/2 lens, exposing for 1/20 second on Kodachrome film, with existing light.

Jackson W. Fritz, of Baltimore, saw these two children near Tokyo, Japan. The older boy had been working with his parents in a rice paddy when a rainstorm started, and the family was on its way home. Fritz obtained permission from the parents to take a picture of the youngsters, but "the instant I raised my camera," he says, "the baby brother started to squall." The effect seemed even more appealing than the picture Fritz originally had in mind, so he made the shot quickly, using a Canon III camera with 50-mm Serenar f/1.9 lens. Shutter speed was 1/40 second at f/4.5 on Kodachrome Type A film, utilizing a conversion filter and existing light.

While visiting his parents in North Carolina, Thomas R. Tucker, of Culver City, California, saw this little girl. To Tucker, the child had a haunting and wistful quality of beauty that he wished to record. He made this informal portrait with a Leica IIIf and 50-mm Nikkor f/1.4 lens, exposing for 1/50 second at about f/4. Tucker used a Skylight filter and natural daylight with tinfoil reflector for fill-in light.

PAGE 122 John A. De Visser, Toronto, Canada, photographed this graceful dancer during a theatre performance as her voluminous skirt billowed out in a swirl of color and motion. Picture-taking during a performance is banned by the management of the theatre, but De Visser says, "When I showed the shot to the performer and the theatre staff, I was forgiven." De Visser's camera was a Leica IIIf with 50-mm Summarit f/5 lens, and exposure was for 1/25 second with lens wide open, the only lighting being the stage lights.

The somber, lonely winter aspect of a Montmarte street, contrasted with its crowded gaiety in summer, impelled Leo de Raemy, a Paris photographer, to record its winter mood on a rainy night. The shot was made in the Rue Norvins, with a Retina IIc camera and 50-mm Xenon C f/2.8 lens. De Raemy used a tripod and exposed Kodachrome Type A film for 15 seconds at f/2.8, utilizing existing light.

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The color and architectural lines of this Chicago school formed a design that appealed to Robert G. Koropp, of Glenview, Illinois, who photographed it with a Deardorff 8x10 View camera equipped with 6½ inch Goerz Dagor f/6.8 lens. Exposure was for 1/5 second with lens stop of f/36, on Ektachrome Daylight Type film, using existing daylight.

PAGE 123 To Adolf Wetzel, of Zurich, this snow-covered Swiss farmland presented a calm, tranquil beauty with an atmosphere of loneliness. "I wanted to capture the quieting atmosphere of that landscape," says Wetzel, who recorded the scene with a Linhof Technika camera and 210-mm Zeiss Tessar f/4.5 lens. He used a shutter speed of 1/50 second at f/8. Film was Kodak Panatomic.

PAGE 124 This pert, self-assured model was having her bath when S. F. Jeffries, of Indianapolis, made this shot of her. His camera was an Airesflex with 75-mm Olympus Zuiko f/3.5 lens. Exposure was 1/50 second at f/16, with flash bounced off ceiling, and film was Super-XX.

Bernard McCabe, New York City, says about this picture of his daughter Constance "... the photograph was posed in the sense that the lighting and composition were planned carefully—it is candid in that she was not aware that it was being taken." McCabe made the shot as an experiment in expression and contrasts, using a Leica IIIf camera with 50-mm Summar f/2 lens, and exposing for 1/30 second at f/2, on Super-XX film. Lighting was daylight from a window about 20 feet away from the subject.

PAGE 125 From the window of his home in Vancouver, B. C., Nicholas Gevjick made this shot of a neighbor's baby and kitten sound asleep on a blanket that had been spread on the lawn. Gevjick used a Graflex Super D camera with 152-mm Ektar f/4.5 lens, and made the exposure for 1/60 second at f/11 on Ilford HP3 film. Lighting was hazy sunlight.

It was bedtime for these two children of Hisao Kato, Yugawara, Japan, and sleep had just about caught up with the little girl, so her brother was helping to fasten her sleeping garment. The picture was irresistible, and Kato quietly focused and made the shot with a Contax II equipped with 35-mm Nikkor f/2.5 lens. Exposure, with available light, was on Plus-X film, with shutter speed of 1/50 second at f/4.

PAGE 126 Splashing gaily in the pool created by a natural warm spring, in Japan, this group of happy bathers was photographed by Shuji Ishii, of Tokyo. Camera used was a Nikon S-2 with 28-mm f/3.5 lens, and the shot was made with shutter speed of 1/60 second and lens wide open, on Fuji SS film.

PAGE 127 Hurrying through a park in his home city of Wakayama, Japan, one rainy day, Ayao Emoto saw this woman, whose white umbrella and white galoshes contrasted sharply and pleasingly with the shadows and dull grayness of the day. Einoto, who carries his camera almost everywhere, saw an interesting picture in the contrast and composition, and made the shot quickly with his Automatic Rolleiflex and 75-mm Xenar f/3.5 lens. Exposure was 1/25 second at f/5.6 on Konipan S film, with U.V. filter.

PAGE 128 Karl Bissinger, New York City, posed his model effectively and made this photograph with a Speed Graphic 4x5 Supermatic camera and 127-mm Kodak Ektar f/4.7 lens, exposing for 1/25 second at f/11 on Super-XX film and utilizing existing daylight. Mask used for printing added to the quaint effect.

PAGE 129 In French Morocco, Karl Bissinger made this shot of a group of Chirat dancers.

ERRATUM

We're sorry that the address for entries given in the announcement of the Clayton contest in our *Contests and Markets* column on page 130 of the November issue was incorrect. It should have been: 5420 N. Damen Ave., Chicago 25, Ill.

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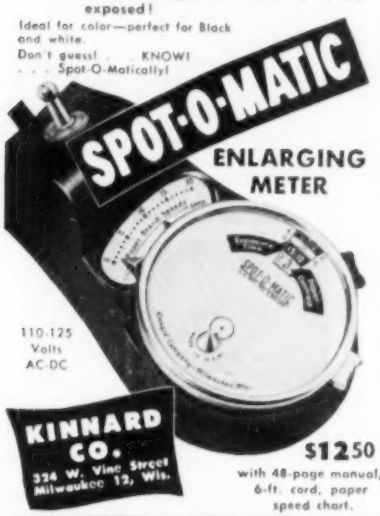

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Camera was a 4x5 Speed Graphic, 127-mm Kodak Ektar f/4.7 lens. Exposure was 1/25 second at f/11 on Super-XX film, with existing light.

PAGE 130 This effective shot of dancer Geoffrey Holder was made by Zachary Freyman, New York City, in his studio, with a Rolleiflex and 75-mm Tessar f/3.5 lens. Super-XX film was exposed for 1/50 second at f/8, and lighting was from three floodlights at side. Partial solarization of the negative was used to produce the effect Freyman wanted.

PAGE 131 Jack Fields, of Belmont, California, photographed these fencers at peak of action during a fencing match, in San Francisco. Fields says, "I was interested in seeing how high a fencer actually leaps during a match—it's pretty high!" The shot was made with a Nikon S-2 camera equipped with 50-mm Nikkor f/1.4 lens. Exposure was 1/50 second and lens stop f/11, on Tri-X film. Lighting was supplied by three ST Stroboflash units and one Heiland Strobonar unit.

PAGE 132 His idea in making this picture, says Kyoichi Matsumoto, of Kobe, Japan, was to express a mood of Orientalism and dedication as conveyed by a dancer in the service of a shrine. The photograph was made at Gokuku Shrine in Kobe. Matsumoto used a camera made by himself and equipped with 180-mm Hexar f/3.5 lens. Exposure was 1/50 second on Fuji sheet film, with existing daylight.

PAGE 133 This graceful figure, photographed by Tullio Stravisi, of Trieste, in his studio, has a classic, sculptured quality. It is one of a series of experimental shots made by Stravisi, using a Rolleicord III and 75-mm Xenar f/3.5 lens. Exposure was 1/100 second at f/5.6, with electronic flash, bounced. Film was Ferrania panchromatic.

PAGE 134 William A. Barnes, of Pembroke, Georgia, was driving along a road in Montana near Great Falls during a thunderstorm. The lightning was intense and spectacularly impressive, and Barnes thought it well worth recording, so he pulled over to the side of the road, removed the front seat of his station wagon, set up tripod and camera, and shot through the rolled-down window of the car. His camera was a Rolleiflex with 80-mm Schneider Xenotar f/2.8 lens; exposure was three minutes at f/22 on Tri-X. A heavy rain was falling, and the only illumination for the shot was the lightning flashes.

PAGE 135 "This was the only snow of that winter, in Paris," says Robert C. Folley, of New York City, "and I was running around like mad to record it before it melted." In the Parc Vincennes, the perspective and vertical pattern of the trees appealed to Folley, and the relatively tiny figure of a woman trudging through the snow heightened the effect of solitude. Folley made the shot with a Leica II and 50-mm Hektor f/2.5 lens, and exposure of 1/25 second at f/4. Film was Plus-X, and lighting was overcast daylight through snow flurries. When printing, he did some burning-in on the solitary figure, to emphasize the effect.

PAGE 136 As piquant Felisa Conde completed a rapid dance movement that sent the skirt of her costume swirling, Zachary Freyman made this peak-of-action shot with a Rolleiflex and 75-mm Tessar f/3.5 lens, using shutter speed of 1/25 second and lens opening of f/8. Side floodlights provided the lighting, and film was Super-XX.

PAGE 137 Freyman used a Rolleiflex and 75-mm Tessar f/3.5 lens to make this picture of Buzz Miller and Peter Genaro in a pose from one of their dance numbers. Utilizing existing daylight in his studio, Freyman exposed Super-XX film for 1/50 second at f/11.

PAGE 138 In the Bethlehem Pacific steel plant in San Francisco, Henry J. Fagliano, of

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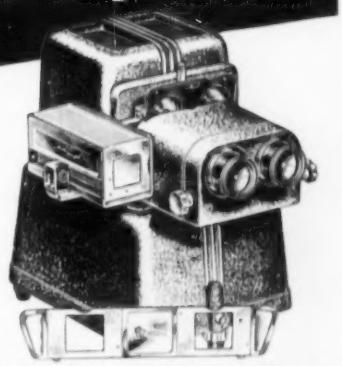

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Oakland, California, made this shot of white-hot steel in motion, catching the split-second pause of man and metal before the steel coil is dropped into a slot. Fagliano's camera was an Automatic Rolleiflex with 75-mm Zeiss Tessar f/3.5 lens. He exposed Super-XX film for 1/50 second at f/5.6, utilizing existing light in the factory.

PAGE 139 Paul Duckworth's informal portrait of *Betty Anne* has captured a wistful, elfin mood and appeal. The picture was made in Duckworth's studio in New York City with a Rolleicord III and 75-mm Xenar f/3.5 lens. Exposure was 1/10 second at f/8 on Plus-X film, with existing light.

PAGE 140 To these attractive young Japanese women, skin diving is not a pastime, but serious business—they are professional divers for abalone and edible seaweed. Tsuguo Yanagiya, Tokyo, who made this shot in the town of Onjuku, says, "The girls engaged in this work have a very unusual occupation, requiring the strength of men and physical endurance beyond that required in most jobs." Yanigiya's camera was a Korelle single lens reflex, with 150-mm Kilar f/3.5 lens. He used a Hansa Y-1 filter, and exposed Super-XX film for 1/100 second with lens aperture of f/8.

PAGE 141 Edouard Kutter, Jr., of Luxembourg, posed his model against a background of part of the remaining wall of a bombed-out structure in Saarbrucken. Kutter says that he always looks for contrast effects for his pictures—here, he felt that the model's skin tones and expression were enhanced and intensified by contrast with the dark, harsh background. The picture was made with a Rolleiflex and 75-mm Tessar f/3.5 lens, with exposure of 1/50 second and lens aperture of f/5.6, and existing daylight.

PAGE 142 While covering a professional football game in California, Henry J. Fagliano, of Oakland, made this photograph of Joe Perry. Fagliano says, "I made a special coverage of Joe Perry since he was about to gain his 1000th yard of the season." Camera used was an Automatic Rolleiflex with 75-mm Zeiss Tessar f/3.5 lens. Shutter speed was 1/100 second with lens stop of f/11, film was Gevapan 33, and lighting was sunny daylight.

PAGE 143 Zvonko Glyck, New York City, planned the composition of this picture of his very young son to convey a mood in which safety, protectiveness, and the baby's trusting confidence would be implied. Glyck arranged the entire camera and lighting setup, assumed the pose with the baby, and at his signal his wife tripped the shutter. The picture was made with an Omega 120 camera equipped with 90-mm Omicron f/3.5 lens, on Super-XX film, at f/7, with electronic flash bounced off ceiling.

PAGE 144 During a long pause in rehearsal of a children's ballet class in Stamford, Connecticut, the youngsters became restive and bored. Ann Zane, of New York City, was attending the rehearsal, and the expressions and attitudes of the young dancers appealed to her as interesting picture material which she proceeded to record with a Nikon camera and 50-mm Nikkor f/1.4 lens. Shutter speed was 1/20 second and lens opening f/2, on Super-XX film, utilizing available light in the auditorium.

Claude Beaumont, New York City, was amused by this youngster who, elated over his newly acquired—though limited—ability to get around by himself, was trying to elude his mother, in a park. Beaumont made a quick shot of the situation with a Leica IIIf and 50-mm Nikkor f/1.4 lens. He used shutter speed of 1/100 second, lens stop of f/11, and Super XX film.

PAGE 145 Morris H. Jaffe, New York City, made this portrait of little Pinny who informed him that she was "all dressed up to go visiting." A quaintly demure charm was

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imparted to the photograph by Jaffe's arrangement of pose and lighting, with the child's interest centered on the card that he gave her to hold while he made the shot with a Nikon S-I and 35-mm Nikkor wide-angle f/2.5 lens. Exposure was 1/20 second at f/4 on Tri-X, and lighting was daylight through a window.

PAGE 146 On a warm day in Spring, Ronald Lumachi, of Brooklyn, N.Y. was walking on the boardwalk at Coney Island when he saw this trio on the beach. Lumachi liked the composition provided by the grouping and reflection in the hard-packed, gleaming wet sand where a wave had just receded, so he focused quickly and made the shot. Camera was an Exakta VX with 50-mm Biotar f/2 lens. Film was Super-XX.

Koro Honjo, Nishinomiya, Japan, created this kaleidoscopic effect of motion by having the model make a complete turn from right to left while camera shutter remained open. Honjo used a Minoltaflex III camera and 75-mm Rokkor f/3.5 lens. Exposure was for about 13 seconds at f/11 on Neopan SS film. Lighting was furnished by two 500-watt lights.

PAGE 147 The picturesque appeal of a row of house fronts reflected in the waters of a canal in his home city attracted the attention of Theo Scheffer, Amsterdam, Holland. Scheffer made this photograph of the scene, using a Contax II camera with 50-mm Zeiss Sonnar f/2 lens. Shutter speed was 1/100 second at f/4, on Ilford HP3. In order to make the lettering of sign on the store front readable, Scheffer reversed the negative in printing.

PAGE 148 In Naples, Italy, the intent gaze of the eyes pictured in these advertising posters had a startlingly realistic quality that impressed and fascinated Pietro Donzelli, of Milan. He photographed them with an Automatic Rolleiflex, equipped with 75-mm Tessar f/3.5 lens, exposing Ilford FP3 film for 1/50 second at f/6.3.

PAGE 149 Masao Yamaguchi, Osaka, Japan, had taken his two little boys to a city park on a pleasant March day. They were visiting the zoo there when the sunlight started to dim and a chilly wind began to blow. Yamaguchi noted this group of monkeys in their enclosure huddling together for warmth, and made this shot. His camera was a Canon, with 50-mm Canon f/1.8 lens. Exposure was for 1/200 second at f/5.6 on Neopan SS.

PAGE 150 Arthur Truss, of Staten Island, N. Y., is a photographer who does some of his work from a helicopter. In order to get this shot of a helicopter pilot during a flight, Truss had to hold his camera outside the cockpit, aimed at his subject—the maneuver required perfect co-ordination between pilot and photographer. Due to space limitations, it was not possible to make the picture from inside the cockpit. Truss used a 4x5 Speed Graphic Pacemaker with 90-mm Schneider Angulon f/6.8 lens. Film was Super Panchro-Press, Type B, and exposure was 1/200 second at f/22.

PAGE 151 News photographer Jay Spencer, Miami, Florida, made this shot in a local hospital, as the night man there in the morgue prepared the necessary instruments for use in autopsies. To get the effect he wanted for this low-angle shot, Spencer had the instruments placed on a sheet of clear window glass. Then, lying on the floor, he aimed his camera upward and made the picture, with flash off camera spotted on subject, so that instruments were silhouetted. Spencer's camera was a Rolleiflex with 75-mm Carl Zeiss f/3.5 lens. Exposure, on Plus-X, was 1/250 second with lens opening of f/16, using one Heiland Strobonar unit.

PAGE 152 Eugenio Petraroli, Milan, Italy, employed careful composition and ingenious

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Write for catalog P-12

PAGE 153 From a window in the reception room of a convent in Mexico, William F. Stickle, Poughkeepsie, N.Y., saw a quiet view of grazing cattle, while sunlight coming through the window threw a square of brilliant light onto the convent floor. The vista and sunlight, contrasting with the tranquility of the dark and sparsely furnished room, formed a design that Stickle found interesting, and he used his Rolleiflex with 75-mm Schneider Xenar f/3.5 lens to record it. He exposed Plus-X film through a light-yellow filter for 1/8 second at f/22. Having neglected to bring a tripod, he braced the camera against a door jamb. Because of the necessary overexposure, Stickle used a mask to hold back the room area in printing.

PAGE 154 On his ranch near Billings, Montana, Palmer M. Pederson was amused by the antics of several cats that trailed after his mother as she carried their food to them. Watching their performance, he got the idea for this picture—which involved having his mother change the feeding place for the cats to the crest of a nearby rise, and much time and patience to get the cats into something approximating single file. After numerous tries and some wasted exposures, Pederson succeeded in getting the shot he wanted, in silhouette against a sunrise sky. His camera was a Kodak Reflex with 80-mm Kodak Anastigmat lens. Exposure, on Plus-X film, was 1/100 second at f/16, using a medium-yellow filter, and existing light.

Edwin Stein, Madison, Wisconsin, used a Speed Graphic Pacemaker with 90-mm Optar wide-angle lens to get this rhythmically patterned high-angle shot of bandsmen in an American Legion parade. It was made from a fourth-story window, with exposure of 1/400 second at f/11, on Royal Pan film, in bright sunlight. Stein's first approach to making the picture was by leaning precariously far out of the window, with an assistant holding his feet. It was a bit too precarious, however, and Stein almost slipped from the assistant's hold. A quickly renewed, firm grip was applied, and he was pulled back into the room, where he proceeded to make the shot from a modified, conventional position.

Prize Winners

COLOR

(Continued from page 155)

"Red, White Into Blue," by Maj. Eugene R. Manfrin, Colorado Springs; "Leaves," by Benn Mitchell, New York; "Fireworks," by Toshikatsu Nakayama, Los Angeles; "Aerialists," by Marvin E. Newman, New York; "Two of a Kind," by Richard G. Neupert, Peru, Indiana; "Cellist," by Roy Pinney and William Ward Beecher, New York; "Pole Vaulter," by Raymond L. Propst, Albany, Oregon; "Waterfront Shacks," by Eugenia Redka, New York; "Sugar and Spice," by William Reynolds, Tuscaloosa, Ala.; "Fire!" by Theodore C. Ruehl, New York.

"Old Railroad Station," by Martin J. Schmidt, Chicago; "Minor Key," by John J. S. Shrader, Glenmoore, Pa.; "Cathy," by Thomas R. Tucker, Culver City, Calif.; "Japan's Youth," by Thomas R. Tucker, Culver City, Calif.; "Circus," by John D. Walker, Brooklyn, N. Y.; "Eating and Bathing," by Stanley S. Walters, W. Hyattsville, Md.; "Jazz Concert," by Don Ward, Cincinnati, Ohio; "Pat and the Melon," by A. E. Woolley, Baton Rouge; "The Farm Girl," by Francis Wu, Hong Kong; "The Girls," by Charles Young, Canton, Minn.

BLACK & WHITE

(Continued from page 155)

"Nude," by Koro Honjo, Nishinomiya, Japan; "My Sister," by Hideo Horii, Aichi, Japan; "Bathers," by Shuji Ishii, Tokyo; "Pinny," by Morris H. Jaffe, New York; "Devotion," by Hing Fook Kan, Hong Kong;

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"Afloat," by Jack Kerns, Rockville, Md.; "Lonely Beach," by Egbert D. Kunst, Amsterdam, Netherlands; "Sigrid," by Edouard Kutter, Jr., Luxembourg.

"August," by Michael A. Mardikes, Kansas City, Mo.; "Double Exposure," by Kyoichi Matsumoto, Kobe, Japan; "Gaspe Peninsula," by May Mirin, New York; "Nude," by Toshiki Ozawa, Sapporo Hokkaido, Japan; "Single File," by Palmer M. Pederson, Billings, Mont.; "Woman," by Eugenio Petraroli, Milan, Italy; "Thief?" by Robert A. Robinson, Woodland, Calif.; "Inmate," by Spencer Ross, Brooklyn, N. Y.; "Amsterdam," by Theo Scheffer, Amsterdam, Holland; "Carlos Lottermoser," by Fred S. Schiffer, Buenos Aires.

"Morgue Keeper," by Jay Spencer, Miami, Fla.; "Band," by Edwin Stein, Madison, Wis.; "Torso," by Tullio Stravisi, Trieste; "Pilot," by Arthur Truss, Staten Island, N. Y.; "Swiss Landscape," by Adolf Wetzel, Zurich, Switzerland; "Boy with Rose," by Lies Wiegman, Wassenaar, Holland; "Monkeys," by Masao Yamaguchi, Osaka, Japan; "Divers," by Tsuguo Yanagiya, Tokyo; "Snowy Landscape," by Hitori Yosizaki, Fukuoka, Japan; "Ballerinas," by Ann Zane, New York.

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"Rubber Grapes," by Enzo Aita, Naples, Italy; "Swallows," by Kitao Ando, Ehime, Japan; "Meditation," by Leonard Balish, New York; "Mirko Kisses Gina," by Leonard Balish, New York; "First Steps," by Claude Beaumont, New York; "Wash Day," by Giuseppe Boila, Milan, Italy; "Make-up," by William Bosch, Brooklyn, N. Y.; "Costume Ball," by Howard Cagle, New York; "Snow Cat," by Walter Chandoha, Huntington, N. Y.; "Hiding," by Walter Chandoha, Huntington, N. Y.
"Temporale," by Elio Ciol, Casarsa, Italy; "The Hurdlers," by Neil P. Clemans, Pasadena; "Mmmm!" by Martin J. Dain, New York; "Still Life," by Jerome V. Deyo, Poughkeepsie, N. Y.; "Strictly Confidential," by Pietro Donzelli, Milan, Italy; "Advertising," by Pietro Donzelli, Milan, Italy; "Betty Anne," by Paul Duckworth, New York; "People," by Henry J. Fagliano, San Francisco; "Joe Perry," by Henry J. Fagliano, San Francisco; "White Heat," by Henry J. Fagliano, San Francisco.
"Rowing at Dawn," by Yip Cheong Fun, Singapore; "Eternal Love," by Peter Gasparello, Brooklyn, N. Y.; "Nap," by Nicholas Gevjick, Vancouver, Canada; "Two Nuns," by Giovanni Ghiglione, Milan, Italy; "Ecstasy," by Chuck Ginnever, San Mateo, Calif.; "Oh Pshaw!" by Emil Glas, Chicago; "Father and Son," by Zvonko Glyck, New York; "Mexican Downpour," by Martha Goble, New York; "Fishing," by Bo Haagen, Uddevalla, Sweden; "Hotel Fire," by Virna Haffer, Tacoma, Wash.
"Gumming up the Works," by Stanley Hall, Yonkers, N. Y.; "Water Skier," by Dennis Hallinan, Cypress Gardens, Fla.; "Moving Nude," by Koro Honjo, Nishinomiya, Japan; "Bashful Boy," by Morris H. Jaffe, New York; "So What?" by S. F. Jeffries, Indianapolis; "Waiting," by Sven-Anders Johansson, Pitea, Sweden; "Tokyo Showgirl," by Walter R. Johnson, APO; "Brother and Sister," by Hisao Kato, Yugawara, Japan; "Posture Attenuated," by Quentin Keynes, New York; "Girl of Snow Country," by Shgaru Koya, Kobe, Japan.
"Love and Indifference," by Gastone Lombardi, Milan, Italy; "Coney Island," by Ronald Lumachi, Brooklyn, N. Y.; "Constance," by Bernard McCabe, New York; "Mr. Smith," by Michael A. Mardikes, Kansas City, Mo.; "Seamy Side of Baseball," by Dick Noon, Escanaba, Mich.; "Ballerina," by Don Pitt, San Francisco; "Reflections," by Kurt W. Roberg, New York; "Nude on Beach," by Thomas Rock, Brooklyn, N. Y.; "Lovers in Summer," by Auro Rosselli, New York; "Whisper," by Daniel R. Rubin, New York.
"Bettina Edelberg," by Fred S. Schiffer, Buenos Aires; "Winter Design," by Alfred C. Schwartz, New Rochelle, N. Y.; "It's Good!" by Susan Sherman, Brooklyn, N. Y.; "Cape Cod Design," by Edward Silverman, New York; "Mambo," by Leo Stashin, Brooklyn, N. Y.; "Mical," by Leo Stashin, Brooklyn, N. Y.; "Politician," by Edwin Stein, Madison, Wis.; "Mexican Window," by William F. Stickle, Poughkeepsie, N. Y.; "Snowy Day," by Nobuo Tabata, Osaka, Japan; "Magic City," by Arthur Truss, Staten Island, N. Y.
"Stroll Along Turnpipe," by Hardy I. Tsuno, Gardena, Calif.; "Young Man with Horn," by A. W. van Stuivenberg, Amsterdam, Holland; "Actor," by Sheldon J. Weston, Flushing, N. Y.; "Dead Wipers," by Cornelius E. Westveer, Pleasant Ridge, Mich.; "Johnnie," by Cornelius E. Westveer, Pleasant Ridge, Mich.; "Sunday Morning," by Adolf Wetzel, Zurich, Switzerland; "Woman in the Window," by Lies Wiegman, Wassenaar, Holland; "Les Sylphides," by Lies Wiegman, Wassenaar, Holland; "Child of Japan," by Akito Yamagata, Tokushima, Japan; "Magic Lake," by Julio Zadik, Guatemala.

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(Continued on page 209)

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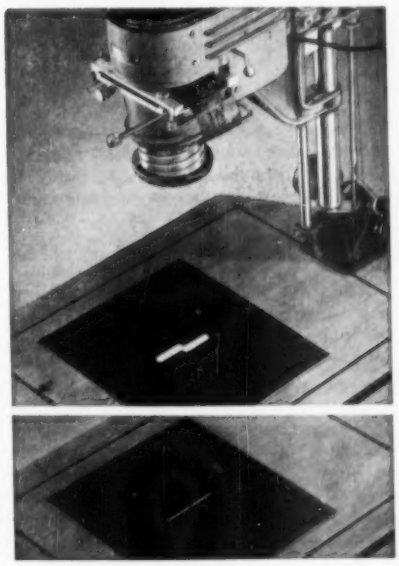

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NEW: 2x2 slide mounts for 120 roll film

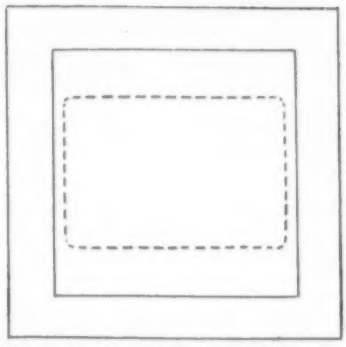
By BOB SCHWALBERG

Frank Rizzatti holds 38x38 film gate and viewing-screen mask used to make 2x2 slides.

The rivalry between adherents of the 2¼x2¼ twin-lens reflex and the 35-mm miniature is photography's long-standing parallel to the War between the Sexes. Ask a distributor of 35-mm cameras how business is going, and seven times out of ten he'll groan "Why do so many owners of our cameras buy some twin-lens job for black-and-white?" Scratch a twin-lens merchant the same way and the odds stand that he'll bewail the fact that so many of *his* customers buy a 35-mm camera for their color work.

Recent sharp counterattacks by the 35-mm forces have included new and improved camera designs, sharper and faster lenses, super-fine-grain high-resolution black-and-white films and superior film developers—all designed to promote wider acceptance of the 35 as a capable performer in black-and-white. But while the 35 has advanced on the monochromatic front, the twin-lens reflex still has comparatively few followers who believe in it as a color camera, despite the miles of 2¼x2¼ color film annually expended by professionals working for the printed page.

The primary reason for this devotion to the 35 as the prime color camera is a little piece of pasteboard measuring 2x2 inches: the 35-mm ready-mount. You shoot your pictures, send the film off to the processing lab and receive bright colored boxes crammed full of ready-mounted transparencies. These color



Waterfront scene, top, made on 120 color film, is framed by 38x38 film gate mask. Below, dotted lines show 35-mm slide area in area of new 38x38 mount.

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slides can be examined and shown to friends by means of small hand-viewers costing from two dollars up. Or, better still, they can be projected by any one of the 106 2x2 slide projectors listed in POPULAR PHOTOGRAPHY'S 1955 Directory.

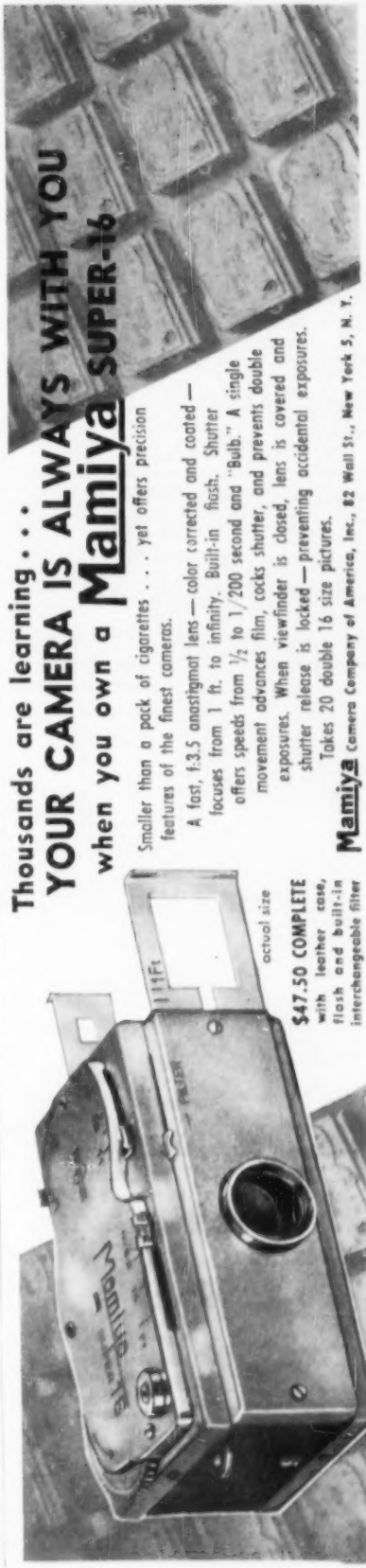
What about 2¼x2¼ color? Is there any reason why it can't be projected? Absolutely not. Cardboard mounts with outside dimensions of 2¾x2¾ are available to handle 2¼x2¼ transparencies, and so are glass mounts with metal and tape binders. Your choice of projectors is, however, somewhat limited. Against 106 2x2 projectors, our 1955 Directory lists only seven designed for 2¼x2¼ transparencies, although a number of the more expensive 2x2 machines can be adapted for 2¼x2¼ projection with accessory condensers, carriers, and lenses.

Why don't people project 2¼x2¼ color, and why is the paltry number of projectors designed for this format so out of proportion to the great popularity of the twin-lens reflex today? In asking this question of photographers, photofinishers, and industry people we succeeded only in enlarging the mystery. Most mentioned "reasons" include: (1) The lure of the 2x2 ready-mount and the tremendous variety of inexpensive projectors available for this format. (2) The long-time supremacy of Kodachrome, available for still photography only in 35-mm. (3) A mass mental block against 2¼x2¼ color that has established "35-mm" as a pseudo-synonym for "color."

One early attempt to bring more color into the twin-lens-reflex picture is the 35-mm accessory back which is widely available for many 2¼x2¼ cameras. But this has never been a really satisfactory answer. Adapted to 35-mm, the twin-lens reflex is great for shooting verticals, but even on a tripod horizontals are difficult and awkward. Most people shoot horizontals most of the time. In addition, the 75- to 85-mm range of focal lengths found on twin-lens reflex cameras produces a telephoto effect on the 24x36-mm format of 35-mm film. This may be fine for many things, but it's just a bit too tight for general photography, especially since you're shooting verticals.

To Frank Rizzatti, technical director of the Burleigh Brooks Co., importers and distributors of the Rolleiflex and Rolleicord cameras, the answer lay in a completely new slide transparency format which would be mounted within the limits of a 2x2 ready-mount. After much analysis and experimentation, Rizzatti and his coworkers arrived at what they think is the answer: *a 38x38-mm transparency in a 2x2 ready-mount.*

Various considerations played their part in determining this answer. The transparency should be as big as possible within the 2x2 limits imposed by the ready-mount. But it must not be so big that it will exceed the covering capabilities of normal 2x2 slide projectors. These are generally equipped with 5- or 7-inch lenses, a bit too large for big-picture projection of standard 35-mm slides in average rooms. And finally, the amount of unused mount area should be sufficient to hold the transparency rigidly on all four sides so as to counter the normal tendency



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of roll film to become limp and lifeless.

Tests with a variety of standard 2x2 projectors indicate that the "super slides," as the 38x38-mm format is respectfully referred to around the Burleigh Brooks shop, are completely interchangeable with standard 35-mm 2x2's and that they project sharp to the edges. In addition, since the super slide ready-mount grips almost ¼ of an inch of film on all four sides of the transparency, the 38x38-mm slides show markedly less tendency to buckle or pop than do standard 35-mm slides whose ready-mounts actually grip only the two long sides of the 24x36-mm transparency along the sprocket holes.

How do you get 38x38-mm film for your twin-lens reflex? You don't. The transparencies are made on standard 120 roll film, 12 pictures to the roll. Obviously, a 38x38-mm picture area involves wasting a substantial bit of the 2¼x2¼ format which is actually about 50x50 mm. The cost factor is, however, quite in line with value received.

There are two main ways in which the 38x38-mm format may be effectively exploited. The first system is to insert a thin black metal mask inside the film gate of the camera so that the film records over the 38x38-mm central area, leaving a black border around the picture. Thin corner lines cut into this mask show the outer dimensions of the 2x2 ready-mount for easy trimming. This system will be absolutely necessary if the big mass-production color-photofinishers are to supply mounting service. A 38x38-mm ground-glass viewing mask must, of course, be used with this system.

A second way of approaching this 38x38-mm idea offers greater control to the serious photographer by taking advantage of the fact that the twin-lens reflex is still going to see in 2¼x2¼ even if we're working for 38x38-mm transparencies. This involves omitting any film-gate mask and cropping your full-frame 2¼x2¼ pictures down to 38x38-mm. A 38 ready-mount provides an excellent, and perfectly accurate, trimming template.

The 75- to 85-mm lenses which are standard equipment on twin-lens cameras give a mild telephoto effect on the 38x38-mm format. When we tried it for several weeks, however, we found it not at all unpleasant. The angle of view (see table) is considerably tighter than that provided by "standard" normal-focal-length lenses today. After having a 38x38-mm mask on the viewing screen of my Rollei for several weeks and removing it to shoot some black-and-white, the 80-mm Xenotar lens seemed like a super wide-angle. The accompanying table shows the approximate field angle in degrees for 2¼x2¼, 38x38-mm and standard 35-mm double-frame pictures with three popular twin-lens reflex camera focal lengths.

When 38x38-mm slides are mixed into a 2x2 projector's automatic changer along with standard 24x36-mm transparencies, the effect is quite startling. This writer happens to be quite enamored of the 2:3 proportions of 35-mm negatives and transparencies, and few of our pictures are ever cropped square. But after a series of projected images about two feet high and three feet wide flash on the screen, the sudden appearance of a slide filling the screen with an image slightly more than three feet high and three feet wide seems tremendous. The 38x38-mm is actually 85 percent bigger in picture area than the 35-mm slide, and standard projectors can really throw large pictures with it. The psychological effect is like comparing 8-mm movies with CinemaScope.

The Burleigh Brooks Co. will soon have 38x38-mm kits available in most camera stores. Each kit will contain a viewing-screen mask, a film-gate mask for the Rollei cameras, and a quantity of 2x2 cardboard ready-mounts with the 38x38-mm aperture. However, this is intended merely as a service to owners of Rollei cameras and as a means of testing public interest in and acceptance of the suggested transparency format. No attempt has been made to monopolize or patent this idea which is, instead, being offered to the entire photographic industry as a means of encouraging greater use of the twin-lens reflex as a color camera for transparencies. As Mr. Rizzatti remarked, "In the past I haven't always been too happy when some of our ideas were copied right down to the smallest detail, but this is one idea that I hope everybody adopts."

What do you think?—▶

FIELD ANGLES FOR VARIOUS FRAME SIZES

Approximate field angles (in degrees) for 2¼x2¼ full negative black-&-white, 2¼x2¼ color slides, 38x38-mm super-slide format and standard full-frame 35-mm 2x2 ready-mount. Figures based on actual picture area utilized by slide-mount.

Focal Length	2¼x2¼ black-&-white negative	50x50-mm picture area used by 2¼x2¼ slide mount	38x38-mm picture area used by super slide mount	23x34-mm aperture used by 24x36-mm 35-mm ready-mount
75-mm	56°	50°	39°	31°
80-mm	53°	48°	37°	29°
85-mm	50°	46°	35°	27°

Prize Winners

BLACK & WHITE

(Continued from page 205)

"Portrait," by Robert J. Anders, FPO; "On Stage," by Donald B. Bailey, Berkeley, Calif.; "Kitchenette," by Jo Banks, Chicago; "Feeding Time," by William A. Barnes, Pembroke, Ga.; "Ritmo D'Acciato," by Giovanni Bartoli, Bologna, Italy; "Sea Lion," by Harald O. Berting, Vienna, Austria; "Coming Up," by Roger C. Bickel, Columbus, Ohio; "Capitol Museum," by Karl Bissinger, New York; "Monte Clift," by Karl Bissinger, New York.

"The String," by Karl Bissinger, New York; "Cat in Haiti," by Frances Borden, New York; "Seascape," by Anne Brennan, New York; "Garden Cat," by Barbara L. Brown, Deep Harbor, Wash.; "Young Cat," by Barbara L. Brown, Deep Harbor, Wash.; "Stripper," by Clifford Brown, Los Angeles; "Watch the Birdie," by Clifford Brown, Los Angeles; "Sister Marilda," by Thomas P. Chen, New York; "Men and Sky," by Elio Ciol, Casarsa, Italy; "Hit!" by Joe Clark, Detroit.

"Draftsman," by Joe Clark, Detroit; "Skipper and Pierre," by Van Deren Coke, Lexington, Ky.; "Semi-Nude," by Robert Conradt, Santa Fe, N. M.; "Boy," by Walter A. Curtin, Oakville, Canada; "Birds and Branches," by Peter R. D'Arcangelo, Douglaston, N. Y.; "Venezia," by Toni Del-Tin, Venice, Italy; "Saloon," by Bob de Wit, Gouda, Netherlands; "The Couple," by Otto Daettwyler, Menziken, Switzerland; "Ecstasy," by Paul Duckworth, New York; "Ballet Dancer," by Daisuke Enomoto, Omiya, Japan.

"Marathon," by Andrew L. P. Ettinger, Dorchester, Mass.; "Tiny Swimmer," by Henry J. Fagliano, San Francisco; "Right Angle," by Jack Fields, Belmont, Calif.; "Umbrellas," by Frances Foote, New York; "Stripteaser," by Robert A. Freson, New York; "Profile," by Sid Fridkin, Pacoima, Calif.; "Stage Faces," by Jack Galloway, Austin, Tex.; "Bathtub Serenade," by J. Wallace Galloway, Edmonton, Canada; "Mexican Children," by Martha Goble, New York; "Fast Break," by Bob Gomel, Flushing, N. Y.

"Fog Bank," by John Gorman, San Francisco; "Presence," by Andre Gueite, Montpellier, France; "Left Behind," by Bo Haagen, Uddevalla, Sweden; "Double Helicopter," by Dennis Hallinan, Cypress Gardens, Fla.; "Top of the World," by Gerrard Healy, Hoboken, N. J.; "Anita Ekberg," by John R. Hearst, Jr., New York; "Tragedy," by John R. Hearst, Jr., New York; "Kay," by Carroll Heitzman, Litchfield, Ill.; "Swimmer," by Fritz Henle, New York; "Coffee Break," by Ken Heyman, New York.

"Geisha Girl," by Kiyoshi Hirohashi, Niigata, Japan; "Neptune's Fury," by Fred G. Hochberg, Avalon, Calif.; "Figure and Barn," by Bob Hollingsworth, Berkeley, Calif.; "Market Day," by Margaret Horwath, New York; "Lovers," by Edward T. Howell, Jr., Avondale, Pa.; "High Man," by Merle E. Hunter, APO; "Winter in Paris," by Merle E. Hunter, APO; "Window Portrait," by Morris H. Jaffe, New York; "Young Orangs," by Kenneth C. Johnson, La Grange Park, Ill.; "Drusilla," by Herbert Kehl, Teaneck, N. J.

"Beth," by Katharine Knowles, Boston; "Curtain Time," by Gerda Lanzer, Vienna, Austria; "Laura and Robin," by Sol Libsohn, Roosevelt, N. J.; "Petite Mona Lisa," by William Lomazow, New York; "Barbara," by Bernard McCabe, New York; "City Night," by Oliver T. Malone, Pittsburgh; "Death-Bed Portrait," by Michael A. Mardikes, Kansas City, Mo.; "Coaches Dream," by Ralph Mills, Jr., Raleigh, N. C.; "Through a Window," by May Mirin, New York; "Child of Snow Country," by Yosio Miyata, Nagoya, Japan.

"Leap," by Yasumasa Nishiyana, Kyoto, Japan; "Iron Worker," by Bob Paul, Holliswood, N. Y.; "19th Birthday," by Don Pitt, San Francisco; "Lady Angler," by Bob Quittner, Santa Barbara; "Farmer and Horse," by Thomas A. Richards, Columbus, Ohio; "John Pinning," by Walter Sarff, New York; "Bell View," by Ranjit Singh, New Delhi, India; "Lay-up," by Jay Spencer, Miami, Fla.; "Woodside Store," by Robert Stade, Redwood City, Calif.; "House and Field," by Tad Stamm, Toledo, Ohio.

"Heatwave," by Leo Stashin, Brooklyn, N. Y.; "Weegee," by Leo Stashin, Brooklyn, N. Y.; "Circus Backstage," by Les Steinberg, Levittown, N. Y.; "High Wire," by William S. Stone, New York; "Subway Cowboy," by Bob Stubenrauch, Long Island City, N. Y.; "Night Ride to Weehawken," by Bob Stubenrauch, Long Island City, N. Y.; "Girl in the Park," by Otto Stupakoff, Porto Alegro, Brazil; "Fabio," by Tullio Stravisi, Trieste; "Surprise," by Pete Turner, Rochester, N. Y.; "Black Cat," by Arlyn Weinstein, New Haven, Conn.

"The Singers," by Sheldon J. Weston, Flushing, N. Y.; "Tulips," by Lies Wiegman, Wassenaar, Holland; "David Owens," by Maynard Frank Wolfe, New York; "Peter Eco," by Maynard Frank Wolfe, New York; "Robert Anderson," by Maynard Frank Wolfe, New York; "William Andersen," by Maynard Frank Wolfe, New York; "Hitting the Trail," by K. F. Wong, Sarawak, Brit. Borneo; "Old Basin Street," by A. E. Woolley, Baton Rouge; "Dripping Oar," by Julio Zadik, Guatemala; "The Photographer," by Henry F. Zeman, Grand Rapids, Mich.—

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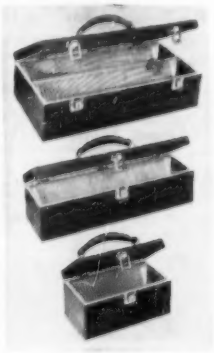

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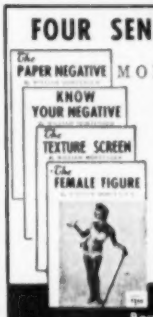

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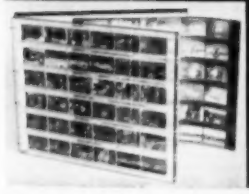

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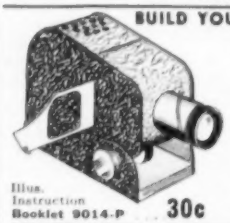

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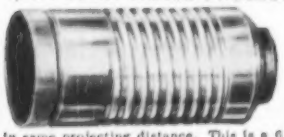

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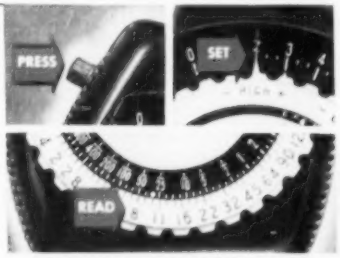

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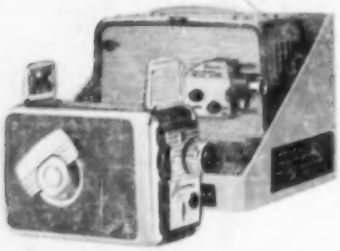

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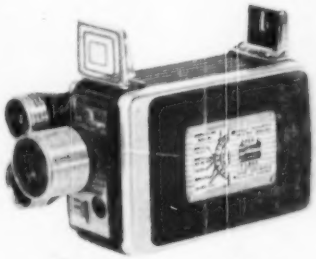
Camera alone, $37.50
Projector only, $62



New . . . versatile turret model

Triples the fun of 8mm movie making . . . makes possible a variety of exciting effects. Handy revolving turret lets you flick additional lens elements into place for wide-angle or telephoto shots. Camera complete—nothing else to buy!

Brownie Movie Camera, Turret *f*/1.9 **$79.50**

For those new parents

Kodak's brand-new Medallion uses inexpensive 8mm film, yet its movies can be projected up to 5 feet wide! Loads with quickly interchangeable factory-loaded film magazines. Fast *f*/1.9 lens; close-up focusing; 4 speeds including slow motion; accepts auxiliary lenses.

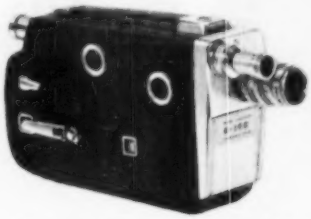
Cine-Kodak Medallion 8 Camera **$144.50**

For the BIG-movie man

The Royal's superb *f*/1.9 Ektar Lens makes 16mm movies with over-all definition and color purity, even when projected 10 feet wide! Convenient 3-second magazine loading. 3 speeds.

Cine-Kodak Royal Magazine Camera **$169.50**

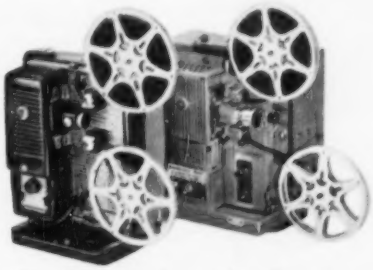
Prices include Federal Tax and are subject to change without notice



For serious movie makers

Kodak's outstanding, new K-100 has many unique special-effect features: 25mm Ektar II *f*/1.9 Lens or ultra-fast *f*/1.4—and you can substitute wide-angle or telephoto lenses, each with matching finder; takes 100-foot 16mm rolls; runs 40 feet at a winding; 5 speeds.

Cine-Kodak K-100 Camera with *f*/1.9 lens **$269**
with *f*/1.4 lens, $369



For brilliant movie shows

Fast *f*/1.6 lens, powerful lamp show all 8mm movies extra bright up to 5 feet wide—forward, reverse, "stills."

New Cine-Kodak Showtime 8 Projector **$115**

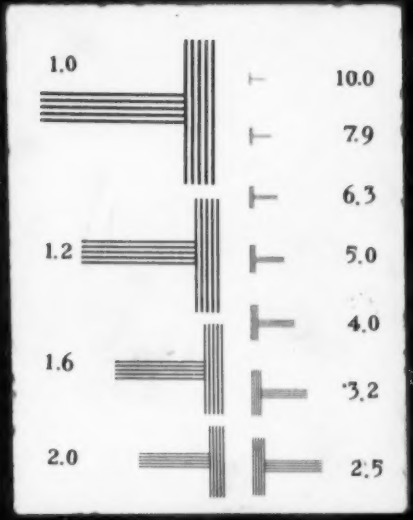
To show 16mm movies up to 10 feet across with color purity, definition.

Kodascope Royal Projector **$240**

Eastman Kodak Company, Rochester 4, N. Y.

Kodak TRADE-MARK

RESOLUTION CHART



100 MILLIMETERS

INSTRUCTIONS Resolution is expressed in terms of the lines per millimeter recorded by a particular film under specified conditions. Numerals in chart indicate the number of lines per millimeter in adjacent "T-shaped" groupings.

In microfilming, it is necessary to determine the reduction ratio and multiply the number of lines in the chart by this value to find the number of lines recorded by the film. As an aid in determining the reduction ratio, the line above is 100 millimeters in length. Measuring this line in the film image and dividing the length into 100 gives the reduction ratio. Example: the line is 20 mm. long in the film image, and 100/20 = 5.

Examine "T-shaped" line groupings in the film with microscope, and note the number adjacent to finest lines recorded sharply and distinctly. Multiply this number by the reduction factor to obtain resolving power in lines per millimeter. Example: 7.9 group of lines is clearly recorded while lines in the 10.0 group are not distinctly separated. Reduction ratio is 5, and 7.9 x 5 = 39.5 lines per millimeter recorded satisfactorily. 10.0 x 5 = 50 lines per millimeter which are not recorded satisfactorily. Under the particular conditions, maximum resolution is between 39.5 and 50 lines per millimeter.

Resolution, as measured on the film, is a test of the entire photographic system, including lens, exposure, processing, and other factors. These rarely utilize maximum resolution of the film. Vibrations during exposure, lack of critical focus, and exposures yielding very dense negatives are to be avoided.